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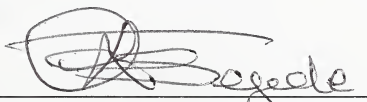
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Dated January 15, 2006

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Discrete Choice Analysis of Determinants of
Membership and Patronage of Co-operatives in Alberta

By

Oyebola Abimbola Jegede

Paper submitted to the Department of Rural Economy in partial fulfillment of the
requirements for the degree of Master of Agriculture

in

Agricultural and Resource Economics

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Faculty of Graduate Studies and Research

The undersigned certify that they have read, and recommended to the Department of Rural Economy for acceptance, a paper entitled *Discrete Choice Analysis of Determinants of Membership and Patronage of Co-operatives in Alberta* submitted by Oyebola Abimbola Jegede in partial fulfillment of the requirements for the degree of Master of Agricultural and Resource Economics.



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Abstract

In this study the factors that could influence people to patronize and become members of co-operatives are examined, by using empirical analysis to examine perceptions and attitudes of respondents with a mailed questionnaire. These factors include socio-economic and demographic variables, respondents' knowledge or familiarity with the concept of co-operatives and their beliefs about co-operatives.

The data for this study come from a mailed survey of 1500 randomly selected households in Alberta. The response rate was 16.9 percent. The questions asked were designed to obtain respondents' familiarity with co-operatives and their attitudes, beliefs and perceptions of co-operatives. Factor analysis, multinomial logit regression and ordered probit regression were carried out to examine links between household characteristics and behavior from the data.

The results indicate respondents' beliefs and knowledge about co-operatives are the main factors responsible for co-operative patronage and membership. Socio-economic and demographic factors have minimal to no effect on respondents' intention towards co-operative products/services, their consideration to patronize co-operatives, and their use or purchase of co-operatives products/services in the last twelve months. However, socio-economic and demographic factors play significant roles in predicting membership status in co-operatives.

Key Words: Co-operative Patronage, Member Commitment, Ordered Probit, Multinomial Logit.

Dedication

I dedicate this study to the memory of my late father Chief Oyewole Jegede (M.O.N) (1934-2004) and my late brother, Oyegoke Jegede (1972-1998). I am eternally grateful to both of them for teaching me how to live. My father's training prepared me for the tough experiences I have encountered.

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I want to thank God for giving me the grace to finish this program despite all odds. This is one remarkable experience!

My sincere appreciation goes to my loving family; my mother Mrs. E.O. Jegede, my sisters Oyelayo, Oyebisi, Oyepeju and my brother Oyeleke Jegede, for their unconditional love and constant support.

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And to any graduate student that picks this project to read, I wish you a pleasant reading and good luck. Hang-in there and do not give up, I never gave up despite unbelievable odds. All the best!

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1.0 Introduction

1.1 Study Background

The current name of the ‘game’ within the co-operative sector is ‘survival of the fittest’. This is as a result of the current on-going structural change phenomenon in the sector, and the fierce competition from investor owned firms (IOFs). Survival strategy makes it imperative that co-operatives more than ever should operate more efficiently in terms of satisfying member needs.

The co-operative business model is uniquely different from the IOF model, in that they are created out of necessity (usually a market failure) and they rely mainly on members’ patronage for business. As originally suggested by Enke (1945) an appropriate objective function of a co-operative may be to maximize the sum of producer surplus (profit) and consumer surplus (lower prices). While the IOFs seek to maximize profit as the bottom line, the long run objective function of the co-operative is primarily to maximize profit and producer/consumer surplus (Goddard E. 2004)¹. IOFs do not have to rely mainly on membership patronage, unlike the co-operative, which is a limitation to co-operatives. Co-operatives may be in a more precarious situation because of the constraints placed on them by the uniqueness of their business model, greater expectations from their numerous heterogeneous owners or membership and the pressures of social responsibility expectations from society at large. Co-operatives are responding to structural changes through various strategies such as mergers, inventive recapitalization, by re-evolving entirely as a new ‘hybrid’ co-operative model such as the New Generation Co-operative (NGC), or on the other end of the spectrum, through absolute buy-out by investor owned firms. A number of issues are responsible for the structural changes in co-operatives.

The importance of membership patronage and commitment for survival is an enduring feature of the co-operative organization. Consequently an adequate volume of members, high levels of members’ patronage and commitment have been identified as some of the

¹ Lecture notes AREC 500, 2004

main factors responsible for co-operative existence. The other important issue is that of management, this is, in form of principal – agent relationships between co-operative members and the managers (Richards et al 1998).

1.2 Problem Overview and Justification

Customer patronage is the backbone of businesses. Understanding customer behavior and recognizing its importance is a paramount key to the success of businesses, regardless of their objective function. This helps the organization satisfy its customers, adopt the marketing concept, and gain legitimacy in society. Overall, both co-operatives and mainstream businesses rely on patronage to remain in business and also for performance evaluation. Member participation and loyalty are integral for the success of the co-operative (Hakelius 1996). Researchers have established a relationship between the attitudes and perception of co-operative members, and concluded that they play a significant role in the behavior of members toward their organization, which in turn impacts the performance of co-operatives (Chacko 1985; Birchall and Simmons 2004).

Currently a number of traditional co-operative organizations are facing considerable financial and organizational challenges. A good example is Lilydale Co-operative Limited², which has recently undergone a major structural change, by turning into a limited ownership IOFⁱ. Fulton and Gibbings (2000) cited membership commitment as one reason for the declining market share and poor financial performance of a number of co-operatives. In many cases these financial and organizational problems are either, associated with, caused by, or manifested through a decline in membership and patronage. Some of the problems are internal or external or both. Internal problems are associated with member heterogeneity, usually related to property rights problems (Cook 1985), and a decline in member commitment (Fulton 1999). Few studies have been conducted on the relationship between the perception, attitudes and beliefs of the members versus non-members of co-operatives that could account for reasons why some people choose to patronize or even be members and while others chose not to.

² Lilydale Foods is one of Canada's largest poultry processors, whose members voted to end its 65-year life as a co-operative and convert it to a conventional corporate structure (The Edmonton Journal, June 23, 2005 and Canada NewsWire, June 23, 2005).

Most of the available studies on member commitment and loyalty to co-operatives have so far been focused on the characteristics of the members of co-operatives, their beliefs, their expectations and the use of communication. Not much has been done empirically on the respective attitudes, beliefs and perceptions of co-operative members and non-members. This study examines the responses to a survey of 1500 randomly selected Alberta households, who were either current or former members or had never been members of any co-operative. It is hypothesized that socio-economic and demographics factors, knowledge, and beliefs are the major factors responsible for co-operative patronage and membership. In the following sections of this study, the selected framework is outlined and applied to investigating the roles of these variables.

1.3 Research Objectives

The objective of this study is to investigate the perceptions and beliefs associated with the attitudes of different categories of co-operative members and non-members in this study, namely current, former, and never been members. This is achieved by applying empirical models used in identifying salient beliefs, attitudes and perceptions, which may influence peoples' behavior to be current members, opt out of (former members), or not to (never) join a co-operative. An attempt is made to examine the influence of some demographic and socio-economic factors that influence their membership decision, and may be responsible for the difference in the behavior associated with their decision to belong to a co-operative or not.

This paper contributes to existing knowledge by studying respondents' socio-economic status and demographics, and their knowledge, beliefs and attitudes about co-operatives. It also examines differences between current, former and never been members of co-operatives. The results obtained in this study can be utilized in predicting the conditions and factors that might be responsible for co-operative member recruitment, retention and patronage. In this paper, attempts to explain why some people join and stay in co-operatives and why others do not will be presented. The strategies that can influence attitudes towards behavioral change with regards to co-operative membership will be discussed. The results of this study can help co-operatives management to design policies

that would facilitate the retention of current members and attract prospective/ never been members and also assist with strategies to increase patronage.

1.4 Study Approach

This introductory chapter is followed by chapter two, a literature review relevant to the objectives of this study. In this literature review, an overview of previous studies on co-operatives and their membership is provided.

In chapter three the research methods, the survey data, the questionnaire, a brief description of the Likert scale type of questions and a description of the variables are outlined. The analytical methods used in the analysis are outlined, such as calculation of the knowledge score variable, factor analysis in the form of principal component analysis.

In chapter four, the theoretical and empirical framework that shapes the analysis of the study is presented. Choice models are briefly discussed with emphasis on elements of decision making process, economic theory of consumer behavior, and discrete choice and random utility models that are relevant to the analysis. Multinomial logit and ordered probit models are also presented as is a brief outline of model estimation.

In chapter five, the selection of the models is presented, and the variables are described the descriptive statistics, cross tabulations.

The estimated results and discussions are presented and discussed in chapter six. This includes the results of the regression analysis. A summary and conclusions are presented in chapter seven. Here, conclusions are drawn based on the analysis and economic interpretations in the previous chapters.

2.0 Literature Review

The first part of this section presents a review of the literature of co-operatives, especially aspects relating to the principles, philosophy, structure, types, and membership of co-operatives. The second part reviews membership commitment by examining the relevance of customer satisfaction in business, as well as the importance of membership volume, and commitment and patronage, and also some aspects that relate to the role of perception, attitudes and beliefs in choice. This provides insight into what has been done by other researchers.

2.1 An Overview of Co-operatives

A co-operative has been defined differently over the years. The Co-operative Secretariat (2004) defines co-operatives as jointly owned enterprises formed by people coming together to meet their needs. Co-operatives can also be seen as unique voluntary organizations comprising a group of people with mutual ownership interest in providing needed service(s) to themselves and their community to accomplish an economic objective. This definition is based on altruistic values and ethical principles, including self-help, democracy, equality, and concern for community.

Co-operative businesses are democratically controlled. Benefits are received in proportion to use as opposed to the level of investment in the capital structure of the co-operative. Richards, Klein, and Walburger (1998) noted that the objective of a co-operative is not necessarily to generate profit, but to provide service, information, and other non-quantifiable services, at least in theory, or according to traditional co-operative principles. The collective ownership of facilities may be properly regarded as control of social wealth to be utilized by any member of the society who can meet the co-operative's membership requirements. Co-operative assets can then be regarded as possessing public-good attributes. The most important co-operative concepts are user-owned, user-benefit and user-controlled. These are the three basic co-operative principles operating that define the essence of co-operative enterprise and differentiate them from IOFs.

2.1.1. The Principles and Philosophy of Co-operatives

According to International Co-operatives Association (2003) and Co-operatives Secretariat, (2003), there are seven main principles of co-operatives. First, membership should be voluntary and open, with no discrimination in membership requirements. Secondly, there must be democratic member control. This translates to the popular slogan 'one member, one vote'. Thirdly, members are required to make economic contribution through initial financial contribution and subsequently through co-operative patronage. The contributions will be used as capital for the business and the profits are paid back to members in form of equity or ploughed back into the business and the community. The fourth principle requires the co-operative to be autonomous and independent. The fifth principle relates to education, training, and information of the co-operative membership. This is to ensure communication with members and also to provide opportunity for members to contribute effectively to the progress of the co-operative. The sixth principle deals with cooperation among co-operatives. The final principle is that co-operatives must have concern for the community. This is because of the community based nature of co-operative businesses, and their focus on member needs. They are required to work towards sustainable development of their communities (Shaffer 1999). These principles basically distinguish co-operatives from IOFs.

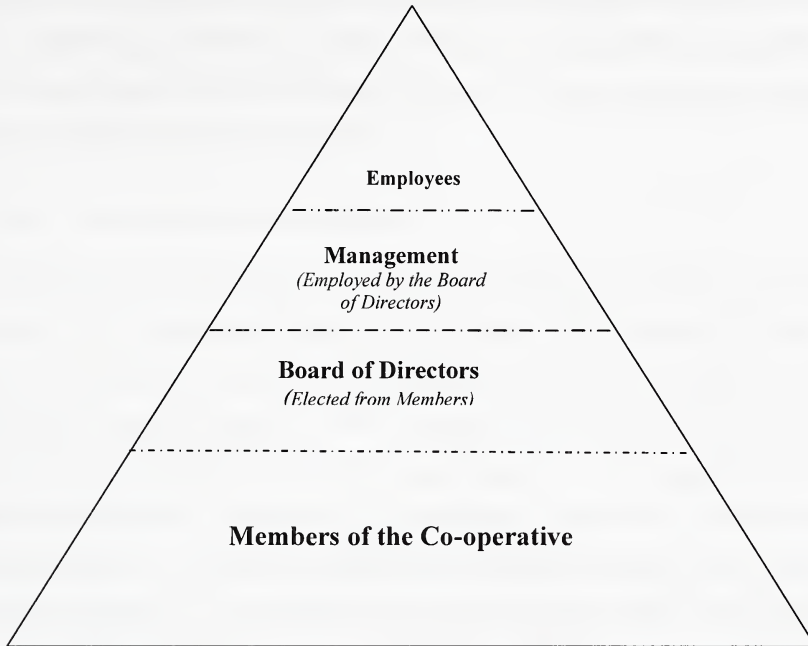
2.1.2. The Structure of Co-operative Business

The structure of a co-operative has a 'bottom-up' approach rather than the top-down approach³ found in IOF business models as represented in Figure 2.1-1. This disparity accounts for the co-operative's unique character. They are democratically controlled, with each member having one vote. Equal power resides with the members who are owners of the business and there are no majority owner(s). Co-operative organizations are formed to provide goods and services to members. Profits can be either re-invested in the co-operative or they can be returned to members in the form of a dividend based on a

³ Bottom-up structure – This is a bottom-heavy structure. Management believes that the members are the ones with the control and the best a manager can do is persuade them. It is basically, recognizing the members as the owners of the business. Customers, in this case the members, are seen as participants rather than as just consumers. Top-down structure emphasizes the power of managers and concentrates on convincing (or forcing) members to do accept their decisions.

member's patronage. Co-operatives are a union of people where traditional businesses tend to be a union of money designed to create a profit for their shareholders.

Figure 2.1-1: Bottom-Up Organizational Structure of Co-operatives



Source: Adapted from Rural Development Institute, Brandon University, Working Paper #2005-1. Accessed October 10, 2005⁴

2.1.3. Types of Co-operatives

The Canadian Co-operative Association stated on its website (August, 2005) that there are 9,500 co-operatives and credit unions in Canada, and one in three Canadians is a member of a co-operative or credit union⁵. These people belong to different types of co-operatives that cater to the different aspects of their needs. There are marketing/producer co-operatives which assist their members at different production stages of their products with aim of capturing high market values. They assist members with sourcing supplies, provision of technical advice and sourcing of buyers for their produce. Consumer/retailer co-operatives sell goods and services to members. Worker/employment co-operatives are

⁴ <http://www.brandonu.ca/rdi/PDF/Working%20Paper%202005-1%20-%20Final.pdf>

⁵ <http://www.coopscanada.coop/aboutcoop/statistics/> both accessed on August 02, 2005

created to provide employment for workers within the organization and members are also responsible for the management as well. Housing co-operatives provide affordable and quality houses for its members, without relinquishing the title of ownership to any member. Service co-operatives are created to provide specific service to its members such as health care, electricity and others. There are also financial co-operatives such as credit unions that provide its members with loan, savings opportunity, banking related facilities, and financial business support.

2.1.4. Co-operative Membership

Co-operative members are users, who can be individuals, partnerships, corporations, and associations, that voluntarily affiliate with the organization, and are involved in the co-operative business with the aim of achieving the objective of solving their economic problems by working together as a unit. Fairbairn (2003) uses the concepts of linkage, transparency, and cognition as the most comprehensive and thoughtful inquiry into the relationships between co-operatives and membership, and the role of membership in co-operative success. Co-operative members can be said to belong to the group of people motivated by affiliation as described in McClelland's theory (1987) of learned needs⁶. He described the need of affiliation as one of the four most important needs that motivate people. The people with a high need for affiliation will perform best in a co-operative environment, because they tend to place the desire to be with others ahead of the need to succeed independently.

Co-operative membership structure is heterogeneous, members have different sized businesses, production technologies, and demographics, therefore may have different goals and objectives. The member individualistic goals increase difficulties for collective action, affect property right issues, and also challenge co-operative principles. It has been stated that this heterogeneity questions the egalitarian treatment principle, (Fulton 1999). Vercammen et al (1996) suggested several strategies for co-operatives to deal with

⁶ McClelland's (1987) theory of learned needs developed an important stream of research around the idea that four basic learned needs motivate people, the needs for achievement, affiliation, power and uniqueness or novelty. He described affiliation as an activity where a group or team must rely on each other for the outcome.

member heterogeneity and disengagement. Despite the heterogeneous nature of its membership, as the owners of the co-operative, members have certain responsibilities to their organization. One of the most important responsibilities is their requirement to conduct business with the co-operative. Tiles et al (2004) noted that co-operatives function best when collective action can facilitate greater member benefits. They went ahead to state that membership commitment and leadership accountability may be problematic to future success of co-operatives.

Gray (1994, 1998) discussed the importance participation plays in constructing farmer understanding and appreciation of co-operative organizations. Gray's results also illustrate the continuing importance of co-operative principles, values of collective action, and member identification with the co-operative organization. Members, as owners of the business, always agree to share equitably investment and operational risks, benefits gained, or losses incurred in proportion to their use of the co-operative's services. The trust and interaction among co-operative members reduces transaction costs.

Fulton (1999) highlighted the falling apart ideology, as the principal source of member commitment in a co-operative. He suggested that co-operative must seek other attribute/s to strengthen member commitment. Otherwise, they will only attract inefficient producers, (Karantinis and Zago 2001). Since membership is the heart of co-operative business, it is therefore imperative that co-operative management relies on the patronage of their members to survive and succeed, due to the structure of the business.

It should be noted that members as the owners of co-operatives are expected to conduct business with the co-operative. However, they are also out to maximize their objective function which is the producer/consumer surplus (producers' profit and members' welfare (Net Benefit) respectively). Consequently, most of them would, despite their responsibility of commitment as co-operative members, seek the most profitable firm to achieve this objective. Reynolds (1997b) examined the role of member consensus and policy consistency in developing member cohesiveness and support for co-operatives in the context of competition and increasing membership diversity. Schrader, et al. (1985) identified factors that are likely to reduce member loyalty toward co-operative. They

concluded that farmers in Indiana and Illinois felt that investor-owned firms offer better financial rewards and operate more efficiently than co-operatives. Co-operatives must therefore be able to identify factors that motivate their members to earn their commitment

2.1.5. Membership and Property Rights

The complex objectives of co-operatives bring with them added challenges. The questions of ownership, benefit and even control are not so well defined for a co-operative because there are different principles and practices at work. This situation, in turn, creates special challenges for the boards of co-operatives.

Member heterogeneity affects commitment as a result of property rights⁷ issues. Where there is collective ownership, the level of commitment varies because the groups and classes of people have different goals and objectives. Cook (1995) identified property rights issues that arise in co-operatives as Free Rider, Horizon, Portfolio, Control, and Influence Cost problems⁸. These property right problems have been linked with poor performance of co-operatives and a decrease in membership commitment, especially the horizon problem. Co-operatives are prone to inefficiencies because of the limited patronage horizon of co-operative members. This is an incentive problem. Since in traditional co-operatives, members can only receive a return on their investment through patronage refunds when they actually use the co-operatives, it is argued that they will tend to support activities that maximize short-term rather than long term returns. This problem is not present in IOFs, because the trading of shares allows the expected future earnings of long term investments to be reflected in the value of the company.

⁷ Property rights problems in co-operatives are incentive problems associated with providing members with a strong degree of ownership and control. Property rights are: non-tradable, insecure and unassigned.

⁸ **Free Rider problem**- members and non-members use or benefit from co-operativesco-operativesco-operativesco-operativesco-operativesco-operatives resources without benefiting from/paying for the full profits/costs.

Horizon problem - disincentive to invest in long term growth given a lack of well defined rights

Portfolio problem - members can't adjust co-operativesco-operativesco-operativesco-operativesco-operativesco-operatives asset portfolio to match personal risk preferences

Control problem - divergence of interests between membership and management

Influence costs problem - diverse activities of co-operatives lead to groups within the co-op having different 'stakes' in decisions, Cook (1995)

The free-rider problem has long been recognized in the literature on co-operatives. There are numerous behavioral differences between co-operatives and IOFs that are attributable to the co-operative principles. For instance, the voluntary patronage characteristics of the co-operatives are a classic example of the free rider problem. Cook (1995) noted that these vaguely defined property rights lead to conflicts over residual claims and decision control.

Porter and Scully (1987) argued that collective action problems which emerge because of improperly specified property rights result in a co-operative having poorer economic performance than an IOF. Sexton and Iskow (1993), however, found out that the financial performance of co-operatives is also generally as strong as that of IOFs, in a survey of the literature on co-operative performance. They concluded that co-operatives are generally no less efficient than other firms. This result can not be said to hold today with co-operatives transforming to IOFs at a higher rate than ever.

Fulton (1999) noted that a co-operative or any firm that has no other base for member (or customer) loyalty than price will have a very difficult time surviving in rapidly changing markets. Many of the people, who conduct business with co-operatives outside their memberships and some within the memberships, do so because of favorable prices. If the price becomes unfavorable, they will move their business elsewhere. This will be detrimental to the long term survival of co-operatives. The distinction between members and non-members can be viewed as a preference for something the co-operative offers and that the IOF does not, which is the basis for member commitment. It can be regarded as the set of characteristics that appeal to one group of people, the members, but not to another, the non-members.

The formation of a co-operative has generally been seen as a response to market failures. However, Fulton (1999) suggests market failures are only a necessary condition for co-operative formation, they are not a sufficient condition. While some sort of market failure is required for the formation of a co-operative, some other elements must also be present. One of these elements is member commitment. Where there is significant commitment to the co-operative, even if the price offered by the co-operative is considerably lower as

compared to that offered by the investor owned firm, members would prefer to do business with their co-operative because of the other overall economic gain rather than pure financial gain as in IOFs.

2.2 Member Commitment

2.2.1. The Effect of Member Commitment on Co-operatives

Member commitment is critical because it is a measure of how well a co-operative is able to differentiate itself from an investor-owned firm (IOF). The greater the ability of a co-operative to differentiate itself from an IOF, the easier it is for the co-operative to retain its market share as borders break down and as big multinational companies move into their non traditional areas of business. Tiles et al (2004) indicate that shared goals and mission are critical to the optimal functioning of co-operatives, and lack of membership commitment and leadership accountability may be problematic for its future success.

Members are more informed in this era of communication, globalization and free trade and they tend to hold management and the board more accountable for their decisions and actions. They also hold them to high standards of performance. Management in turn rely on member patronage to enable them to generate the expected profit. Generally, accountability is often expressed as profit, which is regarded as the responsibility of management to members. There is a form of interdependency between co-operative membership and its management, with greater expectations from the management side and great reliance on member patronage. Hakelius (1996) noted that members are a vital part of any co-operative organization and the active patronage and loyalty to a co-operative's business is integral for the success of the co-operative.

Communication is especially very important in terms of the relationship between the two parties. Burt and Wirth (1990) found that farmers "felt members were poorly informed about the operations of their co-operative". Effective communication is very crucial between members and management. This can be better achieved if management is knowledgeable and understands needs and expectations of their members in dynamic environment. For this to be achieved, management has to listen attentively to the needs of

the members, process their needs and send constructive feedback in the form of change to its members. Wadsworth (2001) note the importance of communication between members and managers (Board of Directors and managers) of co-operative. The channel of communication also plays a very important role achieving effective communication.

Trechter et al (2002) in their study on using communications to influence member commitment in co-operatives, concluded that there is a relationship between members commitment to the co-operative and the techniques used to communicate with members. They found that employees are very important sources of information for many members. They suggested that co-operatives should ensure that employees who have high levels of contact with the patrons, understand and can clearly articulate the information the co-operative need its members to have. Such knowledge would help management to direct their resource towards the most effective and efficient survival strategy, and to thrive in this dynamic sector. Their results indicated that there are relatively simple things co-operative can do to achieve the result. For example, a newsletter is more effective in building commitment if it is published more frequently. Furthermore websites enhance or complement the impact of a co-operative's newsletter, focus groups and member surveys.

However, while there are challenges, the user-owner aspect strengthens the potential link between the user, who is also a customer, and the co-operative. Co-operative management needs the patronage of the members to harness their performance due to the uniqueness of the co-operative business model (members' dependent). Hence, an encouraging environment provided by good management will empower members to take the responsibility of ownership through patronage and commitment. This level of commitment varies across demographics, member's needs and expectations, and level of investment.

Fulton and Adamowicz (1993) found that member involvement is more likely if members share in patronage refunds, if availability of related agricultural services is important to them, and if a higher percentage of their income comes from farming. Inclusiveness of all members encourages members' commitment.

The importance of the volume of business the members conduct with their co-operative has an effect on their level of commitment. Gray and Kraenzle (1998) identified characteristics that influence member participation in dairy co-operatives. Participation measures included attendance at meetings, serving on committees, serving as an elected officer, and recruiting other farmers to become members. They showed that in addition to a number of other factors, such as gross farm sales and the percentage of gross farm sales from the sale of milk, both were positively related to the attendance at meetings for members of a dairy co-operative in the United States. Gray and Kraenzle (1999) also concluded that co-operatives might need to change their governance practices to increase the involvement of smaller farms and to emphasize co-operative principles, the benefits of cooperation and the importance of participation in member education.

The challenge remains: how can co-operatives improve their business through customer satisfaction, which can be reflected by members' commitment? How can they improve customer satisfaction by retaining their current members? And how can co-operatives attract new memberships? Understanding the attitudes of members by focusing on their dynamic needs and wants would shed some light into their needs, thereby give an opportunity to influence their behavior. This can be achieved by understanding the mental and physical activities undertaken by members that result in decisions and activities to patronize their co-operative through the analysis of their perception and attitudes.

2.2.2. Customer (Member) Satisfaction

Drucker (1954)ⁱⁱ believes that the purpose of business is to create and then retain satisfied customers. He has also noted that although firms have to make money, making money is a necessity, not a purpose. These statements are particularly true for co-operatives. However, although co-operatives are not only in business to make profits, every business needs capital for survival and sustainability. This makes it imperative for co-operative to generate revenue through financial profitability, but without making profitability the only objective of the business. The co-operative business culture is people/relational structured. It incorporates member satisfaction as an integral part of the business mission,

and it utilizes the understanding of customer behavior as a major input towards its business plans and decisions. This makes customer patronage and satisfaction one of the co-operative's most important sources of profitability, and a major input towards its overall success. Co-operatives should be member oriented to succeed.

A member orientated co-operative means a thorough understanding of member needs, wants, the competitive environment, and the nature of the enterprise used to formulate all of the co-operative's plan and actions to create satisfied members. Consequently, it is logical to assume that members would support their co-operatives business if it serves them by catering to their needs and wants. This puts greater responsibility on the management of co-operative as agents, whose duty it is to maintain the objectives of the co-operative business, and also keep the business as a going concern.

Over the last decade, literature on member commitment in co-operatives has provided numerous important insights into the determinants of some of the factors responsible for joining co-operatives. However, available literature still lacks empirically tested theoretical models on the factors that might be responsible for the increasing or decreasing membership and patronage in co-operatives. Literature reviews have shown that co-operative business success consists of longevity, member business growth, profitability, and member satisfaction (Bruynis et al 2001). Fulton (1999) noted that although market failure is necessary for the formation of co-operative, it is not sufficient for long term viability. Fulton and Adamowicz (1993) pointed out that historically, member commitment has been an essential ingredient in the survival of co-operatives, and it continues to be important even today. The main driving force behind the formation of co-operatives is member commitment.

Sexton and Iskow (1998) concluded that one of the reasons for co-operative failure is the lack of sufficient membership and volume, as well as poor management. However, in their 1993 study, Sexton and Iskow also noted that the study failed to consider other services often provided by co-operative such field services, market information, lobbying and ancillary. Although often neglected, these ancillary services can increase a co-

operative's production costs, leading to the incorrect conclusion that co-operative are inefficient.

Fulton (1999) noted that member commitment is one of the critically important issues any co-operative faces, because it is a measure of how well a co-operative is able to differentiate itself from an investor-owned firm (IOF). He further described member commitment as a sort of 'glue' that allows membership and business volume to be maintained even as trade becomes more fluid and barriers to reorganization are broken down. The importance of member commitment and patronage in co-operatives can not be over emphasized. It has been suggested that lack of member commitment, in addition to mismanagement, led to the demise of an Alberta interregional grain marketing co-operative.⁹

2.2.3. Effects of Socio-economic and Demographic Factors on Patronage and Membership

The open and equality principle of the traditional co-operative puts limitations on selective membership or classification of its members. As mentioned earlier, co-operative membership is heterogeneous. This is a result of differences in socio-economic and demographic indicators such as age, education, farm size, etc of the members. This makes it imperative that members would have different expectations based on their socio-economic and demographic characteristics.

Iliopoulos and Cook (1999) suggest that the degree of membership heterogeneity should be measured by the following seven variables: geographic dispersion of membership, the number of different commodities/inputs produced/purchased by the members, variance in member's age, variance in members' educational levels, differences between members in terms of farm size, increased percentage of non-farm income for some members, and differences between members in terms of business objectives. The empirical results of their study indicated that variance in the size of members' farms was the most crucial dimension of heterogeneity.

9 USDA/ Rural Development Report "Agricultural Co-operatives in the 21st Century" (RBS Co-operative Information Report 60.) January/February, 2003. <http://www.rurdev.usda.gov/rbs/pub/jan03/jan03.pdf>

Fulton and Adamowicz (1993)'s theoretical analysis was ambiguous about the effect of age on member commitment. Their additional analysis, revealed that the age of the farmer significantly affects the importance the member places on the ability to share in profits through dividends. Staatz (1989) suggests that older farmers may be less loyal to their co-operative because they plan to retire soon and therefore do not expect continuing benefits from the co-operative. On the other hand, younger farmers are predicted to be less loyal to their co-operative since they are often highly leveraged and hence have high discount rates. They found that age did not have statistical significance on patronage, but further analysis considered whether age had an indirect effect on patronage. In particular, the effect of age on member perception of the importance of dividends was examined. They found that the coefficients on the age variables were all negative and statistically significant.

Hakelius (1996, 1999) examined generational change and farmers' perceptions of co-operatives and their commitment to them. He found that while older farmers view fairness and solidarity as the top ranking reasons to do business with the co-operative or to participate in the co-operative's democratic process, these are secondary to economic efficiency in the minds of younger farmers.

Burt and Wirth (1990) in their study concluded that farm size and farmer age did not appear to influence perceptions about supply co-operatives. They found membership status of the farmer in the co-operative was important in some cases. Lower prices in lieu of easy credit and patronage refunds were found to be acceptable to farmers, but not at the expense of good service. Managers placed great importance on member loyalty to the supply co-operative without regard to price consideration.

Other factors such as gender and income have not been seen as issues affecting either membership or commitment of co-operative membership. Fulton and Adamowicz (1993)'s study with data from member surveys of a large grain marketing co-operative, indicated that the factors that influence member patronage are: the ability to share in profits through dividends, the ability to purchase chemicals and fertilizers at the grain elevator, and the percentage of the total farm income obtained from grain operations.

They also found some evidence that farmers' patronage is positively associated with competitive grain pricing and negatively associated with the firm being active in the community.

This research evaluates the relationship between respondents' demographic variables and co-operative patronage. Such variables include age, gender, income, and education. Respondents' beliefs and perceptions are also examined, to determine their relationship with co-operative patronage.

2.2.4. Effects of Perceptions, Beliefs, and Attitudes on Membership and Patronage

Perception can be described as an understanding through observation, or through the opinion of an individual or group of people. Chacko (1985) and Birchall and Simmons (2004) found that member attitudes and perceptions play significant roles in member behavior toward their organizations. The members' attitude toward their co-operative organization is determined by what they think and believe rather than by what the facts may be. It is the duty of the management of the association, therefore, to employ strategies to get the real facts before the members, and it is the responsibility of the members to acquire information provided by the association.

The assimilative effects of perception on behavior can be regarded as the default effect, and the result of this can be positive or negative. According to theories of action control, multiple action tendencies often become simultaneously activated and divergent tendencies may subsequently compete to guide a person's behavior. There is a strong relationship between perception and behavior. Perceptions may have direct and indirect effect on co-operative membership, and patronage and member commitment. This may eventually impact peoples' behavior to choose co-operatives as their preference.

Some empirical research has shed light on farmers' views of co-operative. In a study conducted in Indiana and Illinois, Schrader et al (1985) measured farmers' perceptions of co-operative and investor-oriented firms' ability to provide higher financial returns and operate more efficient operation than co-operatives. With respect to those measures of

performance, farmers perceived the performance of the co-operative to be better than that of IOFs. Burt and Wirth (1990) surveyed farmers and managers of farm supply co-operatives in Willamette Valley of Western Oregon. Their responses showed that many members many of them felt members were poorly informed about the operations of their co-operative. Farmers would not be loyal to a co-operative if they perceive that they had to pay higher prices, and they seemed to reject egalitarian principles of equal prices and easy credit as well. Therefore, it can be stated that perception informs behavior.

2.2.5. Measurement of Perception, Belief, and Attitude

Attitudes are the affective feeling that people have about an object, and beliefs are the cognitive knowledge about an object/organization, their attributes and their benefits¹⁰. Attitudes are learned, they result from people's evaluations of things such as objects, groups, products, people, brands, organizations and so on, which are formed on the basis of some experience with or without information about the object (Sheth and Mittal 2004). They went further, that a person's attitude about an object can be a function of the beliefs that a person holds with regard to the attitudinal object, but can also be a function of the importance of the individual attributes about which a person has beliefs. Some emotion toward the object can be positive or negative, resulting in the person acting in a certain way toward the object, by either embracing it or rejecting it. Cognition¹¹ about an organization is the beliefs of expectations about it. Statements of belief connect an object to an attribute or benefit. While affect is the feelings a person has toward an object or the emotions that the object evokes for that person. When members' goals are satisfied, they experience a positive affective state; when goals are thwarted, negative affect results. In addition, emotions vary in terms of the amount of arousal associated with them. Sheth and Mittal (2004) also identified the three underlying dimensions to global attitude identified by psychologists are cognition (knowledge), affect (feeling), and conation (action).

¹⁰ Characteristics or features than an object might or might not have. The positive outcomes that attributes might provide to the consumer.

¹¹ The psychological result of perception and learning and reasoning

Affect describes the feelings, emotions, and moods experienced by them. Conation¹² is the action a person wants to take toward the object, which can be positive or negative. The consistency of cognition and affect can be related to their valence and intensity. Attitude valence refers to favorable and unfavorable thoughts, feelings and actions. Consequently, favorable cognitions or actions are associated with positive affect, and unfavorable cognitions with negative affect. Whereas intensity is the strength with which beliefs or feelings occur, which can be strong or weak, mild or deep. This can be reflected through respondents' choice of the answers. Sheth and Mittal (2004) describe attitude strength as the degree of commitment a person feels toward a cognition or feeling or action. This is also the level of involvement of the person making the decision and the kind of decision in context. Some of these can be high involved or low involved activities or personality. Strong beliefs produce strong feelings and very committed action tendencies, and vice versa.

The idea that attitude refers to affect or a general evaluative reaction has been expressed by many researchers. Thurstone (1959)¹³ defined attitudes as the amount of affect or feeling for or against stimulus. Attitudes are stored in long-term memory, and they lead to beliefs. Beliefs are the knowledge and inferences that a consumer has about objects, their attributes, and benefits provided by them. Belief can also be based on perception.

Gordon (1935) defined attitudes as learned predispositions used to respond to an object or class of objects in a consistently favorable or unfavorable way. This implies that attitudes are predispositions, hence, they reside in the mind. They get formed on the basis of some experience with or information about the object, and attitudes cause consistent response, they precede and produce behavior, (Sheth and Mittal 2004). Therefore attitudes can be used to predict behavior.

Understanding people's beliefs, perceptions and attitudes towards co-operatives would assist predicting their behavior with respect to their patronage, commitment and membership status in co-operatives. People evaluate things in terms of their goodness,

¹² The aspect of mental processes or behavior directed toward action or change and including impulse, desire, volition, and striving.

¹³ In Mowen, John C. & Minor, Michael (2001) *Consumer Behavior: A Framework*

likeability, or desirability. As such, it is possible to measure attitudes by getting people to rate statements. Attitudes can be measured by asking respondents to rate how well each statement describes them or their beliefs. Measurement of this is reflected in the valence and intensity of respondents' answers to the questions.

3.0 Methodology

This chapter describes and discusses the survey methods used in this study. It provides information on the survey, the survey data, and structuring of the questionnaires through the use of the Likert¹⁴ format. It also provides a brief introduction to the variables used in this study and their codes. This covers both the dependent and independent variables. Two main analytical methods were used in the initial analysis of the data from the survey. They were the methodologies used to calculate knowledge score (mean score) and factor analysis (Principal Component Analysis (PCA)). The chapter is concluded by presentation of statistics on the variables used in the analysis.

3.1 The Survey

The source of the primary data for this study was from the results of a mailed questionnaire survey, carried out in the spring of 2004. A survey was sent to 1500 randomly selected Alberta households, regardless of whether they were rural or urban dweller and regardless of their co-operative membership status. The mailing list of the survey was developed using postal codes and census maps in order to guarantee proportional sample representation within the province. A stratified random sampling technique was used¹⁵. The questions asked were to obtain respondents' familiarity with and their attitudes towards co-operatives.

3.2 The Questionnaire

The questionnaire for the survey was designed to identify respondents' awareness and attitudes, and perception towards co-operative, as well as to measure performance of co-operatives in some selected categorical areas. There were five main sections in the questionnaire.

¹⁴ The Likert scale is rating scale used to measure attitudes, preferences, and subjective reactions by measuring the strength of agreement with a clear statement. It was developed in 1932 by Renis Likert.

¹⁵ A stratified sample is obtained by taking samples from each stratum or sub-group of a population.

Section One had two parts, A and B respectively. Section One, part A, contained questions about the respondents' demographic information which includes postal code, age, gender, level of education, and income. Part B questions, on the other hand, addressed information on their professional activities related to agriculture or non agricultural field. This is to determine the level of the respondents' affiliation to agriculture.

In Section Two, respondents were asked about their familiarity with co-operatives, and understanding of co-operative concepts. The first question in this section was designed as the screening question. Respondents were asked if they have ever heard, seen or read something about co-operatives/credit unions before the survey. Those who answered yes proceeded with the survey and the people who were not familiar with co-operatives were instructed to exit the survey at this point. The first part asked about the valence¹⁶ of their understanding, with a true or false option. Then they were asked about how sure they were about the yes or no answer given. This aspect measures intensity of the answers given. The seven alternatives were provided in a Likert scale format, the choices for the answers ranging from 1 (Not sure at all) to 4 (Indifferent) to 7 (Absolutely sure). The answers provided in this section were used to calculate the knowledge scores of the respondents. People who were not familiar were assumed to have a knowledge score of zero.

There were two parts in Section Three, A and B. The questions solicited respondents' opinion about some general statements toward co-operatives/credit unions and investor owned firms (IOFs)/banks and trust companies. Part A contained seventeen belief questions, the answers are provided in a Likert scale format. The choice of answers provided ranges from 1 (Strongly disagree) to 4 (Indifferent) to 7 (Strongly agree). This was followed by a question to indicate their membership status in co-operatives, whether current, former, never or intend to be members. Part B contained questions related to the names and types co-operative memberships the respondents are associated with, and their

¹⁶ The degree of attraction or aversion that an individual feels toward a specific object or event

current status in such co-operatives. The final part of the section contains some exit interview questions for respondents who indicated that they were former members.

There were six major indicators in the Section Four questions. Here the respondents were asked about their opinion on how important co-operative objectives should be for each of the questions asked under the six major headings. The major headings were marketing and business function, management, customer services, member commitment, environment, and public interest and involvement. Likert scale format was used for the answers, with answers ranging from 1 (Extremely unimportant) to 4 (Indifferent) to 7 (Extremely important).

Section Five is divided into two parts, A and B. In part A, respondents were asked about what is important to their desire to join the co-operative of their choice in Alberta. The answers were provided in a Likert scale format, with answers ranging from 1 (Strongly disagree) to 4 (Indifferent) to 7 (Strongly agree). There are other questions about their level of involvement in co-operatives and the affiliation of their friends and families to co-operatives. Part B questions were designed to evaluate how respondents rate the performance of their chosen co-operative. The answers provided ranges from 1 (Not performing at all) to 4 (Do not know) to 7 (Performing very well). The questions were classified under the six major headings, namely marketing, and business function, management, customer services, member commitment, environment, and public interest and involvement.

The analysis presented in this study focuses on the first three sections of the questionnaire. These are essentially the sections on the socio-economic and demographics background of respondents, their familiarity with and understanding of co-operatives, inclination towards co-operatives patronage, their membership status in co-operatives, and the section that relates to their beliefs about co-operatives.

3.3 Likert Scale

In many of the sections, choices of answers to the questions were presented in the Likert format. Likert scaling presumes the existence of an underlying (or latent or natural)

continuous variable whose value characterizes the respondents' attitudes and opinions. Likert scales allow the respondent to express degrees of agreement. If it were possible to measure the latent variable directly, the measurement scale would be, at best, an interval scale (Clason and Dormody, 1994). This scale ranges from desirable to undesirable or vice versa.

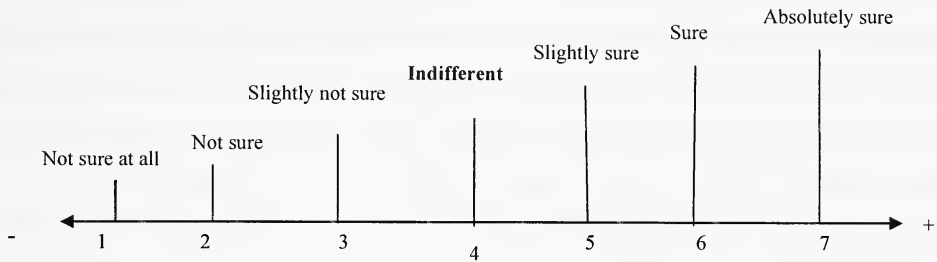
Marketers and customer related organization are interested in knowing customer attitudes about their products and services and other elements of the marketing mix since it helps predict customer behavior. This type of information is also useful to management of organizations which are interested in understanding and motivating their membership. Multiattribute models account for the notion that customers or memberships alike might combine several beliefs about something into a global attitude. Therefore attitudes can be used to predict behavior. People evaluate things in terms of their goodness, likeability, or desirability. As such, it is easy to measure attitudes by getting customers to rate statements. The respondents of this questionnaire were asked to choose the best alternative that best represented their level of agreement with each of the statements. Usually there were five or seven of these alternatives on the Likert scale. Each degree of agreement on the Likert scale is given a numerical value from one to five or seven, with each choice representing their level of agreement (desirable to undesirable).

The level of scaling obtained from the Likert procedure is rather difficult to determine. Goldstein and Hersen (1984) noted that scale is clearly at least ordinal. Those persons with the higher level properties in the natural variable are expected to get higher scores than those persons from lower properties. Clason and Dormody (1994) also noted that in order to achieve an interval scale, the properties on the scale variable have to correspond to differences in the trait on the natural variable. Since it seems unlikely that the categories formed by the misalignment of the five/seven responses will all be equal, the interval scale assumption seems unlikely.

In the questionnaire used for this study, the seven point Likert scale was used to solicit the nearest response to attitudinal questions asked. In the Likert scale formats used in the questionnaire, choice of responses ranges from 1 (Strongly disagree) to 4 (Indifferent) to

7 (Strongly agree), or from 1 (Extremely unimportant) to 4 (Indifferent) to 7 (Extremely important), and also from 1 (Not sure at all) to 4 (Indifferent) then to 7 (Absolutely sure). Figure 3.3-1 shows a representation of Likert scale.

Figure 3.3-1: The Likert Scale



3.4 Overall Data Description

The response rate of the survey was 16.9 percent, which is low in spite of the incentives provided to the respondents.¹⁷ In total, out of the 246 questionnaires received, about 80 percent of the total respondents were familiar with co-operatives. The remaining 20 percent indicated that they were not familiar with co-operatives, and did not understand the concept of co-operatives. The non-familiar group did not complete any other parts of the survey. The details are shown in Table 3.4-1 and illustrated in Figures 3.4-1 to 3.4-5.

About one percent of total respondents were in the less than 20 years old age group, and none of them was familiar with, or understood the concept of co-operatives. The largest age group of respondents was the over 55 year old age group, with about 44 percent of the total population. This was followed by the 45-54 years old age group with 27 percent, and then the 35-44 year old age group with 15 percent. The rest of the respondents were in the 21-34 year old age group with almost 14 percent. Over 40 percent of the respondents who were not familiar with co-operatives were in the over 55 age group, but they account for less than one fifth of the respondents within their age group. In contrast,

¹⁷ A Tim Horton's gift certificate, and pre-paid envelopes included in the mail out to enable respondents mail to the questionnaires back at no financial cost to them. A letter explaining the significance of their participation in the survey was also included.

100 percent of the less than 20 year olds are not familiar with co-operatives. And about 20 percent of the respondents not familiar with co-operatives are 21-33 year olds, and they accounted for 30 percent of the respondents in their age group. About 15 percent of the respondents in the 45-54 year old age group were not familiar with co-operatives.

One third of the respondents familiar with co-operatives were females. This is proportionate to the pattern of gender distribution of the data, where about 35 percent of the total respondents are females. 29 percent of these females were not familiar with co-operative concept. In comparison, only 17 percent of the total male respondents were not familiar with co-operatives. Overall males accounted for 52 percent of respondents not familiar with co-operatives, and 69 percent of the respondents familiar with co-operatives.

All the respondents whose annual income before tax is over \$150,000 per annum are familiar with the co-operative concept, and they account for about 5 percent of all the respondents. Over 50 percent of the respondents earned less than \$49,000 per annum before tax, and about one third of them indicated that they are not familiar with the co-operatives concept. The \$50,000-99,000 earners represent 35 percent of all the respondents, out of which only 16 percent of them are not familiar with co-operatives. The \$100,000-149,000 income group account for 8 percent of the total respondents and 90 percent of them are familiar with the concept of co-operatives. The high income earners tend to be more familiar with co-operatives, with the exception of \$100,000-149,000 income group earners.

In terms of education status, overall, both college/technical educated and university graduates have about the same percentage of respondents, this is about 28 percent each. About 18 percent of respondents in each of these groups are not familiar with co-operatives. On the contrary, respondents with less than high school qualification account for about 12 percent of the total respondents, and over 30 percent of them are not familiar with co-operatives. High school holders have the highest group of respondents that are not familiar with co-operatives concept, with almost 29 percent. The graduate school degree holders represent about 11 percent of all respondents, and 12 percent of them are

not familiar with the concept of co-operatives. Results from the data indicate that, the higher the level of education, the greater the familiarity with co-operatives.

About 77 percent of the total respondents are urban dwellers, 24 percent of these urban respondents are not familiar with co-operatives. In comparison, only 23 percent of the total respondents were rural dwellers, from which less than 6 percent of the rural dwelling respondents are not familiar with co-operatives. Most of the rural dwellers are familiar with co-operatives. The respondents not familiar with co-operative concepts did not complete any other part of the survey.

Table 3.4-1: Respondent's Familiarity and Understanding of Co-operatives Concepts

Variables		Categories								TOTAL	
		Not Familiar				Familiar					
		Groups	N	Group	Category	Total	N	Group	Category	Total	N
AGE	≤ 20	3	100%	6.1%	1.2%	0	0%	0%	0%	3	1.2%
	21-34	10	30.3%	20.4%	4.1%	23	69.7%	11.9%	9.5%	33	13.6%
	35-44	6	17.1%	12.2%	2.5%	29	82.9%	15.0%	12.0%	35	14.5%
	45-54	10	15.4%	20.4%	4.1%	55	84.6%	28.5%	22.7%	65	26.9%
	≥ 55	20	18.9%	40.8%	8.3%	86	81.1%	44.6%	35.5%	106	43.8%
	Total	49	20.2%	100%	20.2%	193	79.8%	100%	79.8%	242	100%
GENDER	Female	24	28.6%	48.0%	9.9%	60	71.4%	31.3%	24.8%	84	34.7%
	Male	26	16.5%	52.0%	10.7%	132	83.5%	68.8%	54.5%	158	65.3%
	Total	50	20.7%	100%	20.7%	192	79.3%	100%	79.3%	242	100%
INCOME (' 000)	≤ \$49	34	28.1%	69.4%	14.5%	87	71.9%	46.8%	37.0%	121	51.5%
	\$50 - 99	13	15.7%	26.5%	5.5%	70	84.3%	37.6%	29.8%	83	35.3%
	\$100 -149	2	10.5%	4.1%	0.9%	17	89.5%	9.1%	7.2%	19	8.1%
	\$150 -199	0	0%	0%	0%	7	100%	3.8%	3.0%	7	3.0%
	≥ \$250	0	0%	0%	0%	5	100%	2.7%	2.1%	5	2.1%
	Total	49	20.9%	100.0%	20.9%	186	79.1%	100%	79.1%	235	100%
EDUCATION	≤High School	8	28.6%	16.3%	3.3%	20	71.4%	10.5%	8.4%	28	11.7%
	High School	14	25.9%	28.6%	5.9%	40	74.1%	21.1%	16.7%	54	22.6%
	College Tech.	12	17.9%	24.5%	5.0%	55	82.1%	28.9%	23.0%	67	28.0%
	University	12	18.5%	24.5%	5.0%	53	81.5%	27.9%	22.2%	65	27.2%
	Grad. School	3	12.0%	6.1%	1.3%	22	88.0%	11.6%	9.2%	25	10.5%
	Total	49	20.5%	100%	20.5%	190	79.5%	100%	79.5%	239	100%
RESIDENCE	Urban	43	24.3%	93.5%	18.6%	134	75.7%	72.4%	58.0%	177	76.6%
	Rural	3	5.6%	6.5%	1.3%	51	94.4%	27.6%	22.1%	54	23.4%
	Total	46	19.9%	100%	19.9%	185	80.1%	100%	80.1%	231	100%

Figure 3.4-1: Age Group of Respondents

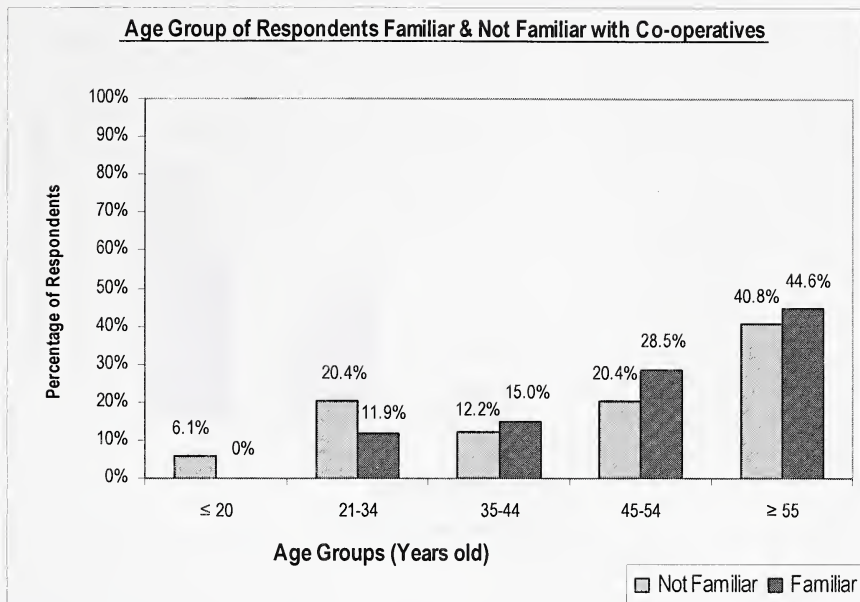


Figure 3.4-2: Gender of Respondents

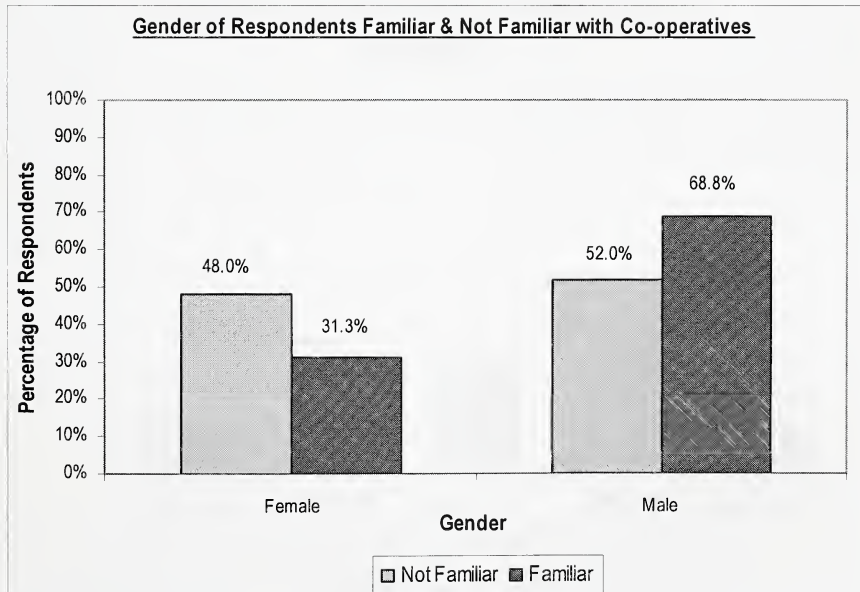


Figure 3.4-3: Income Group of Respondents

Income Group of Respondents Familiar & Not Familiar with Co-operatives

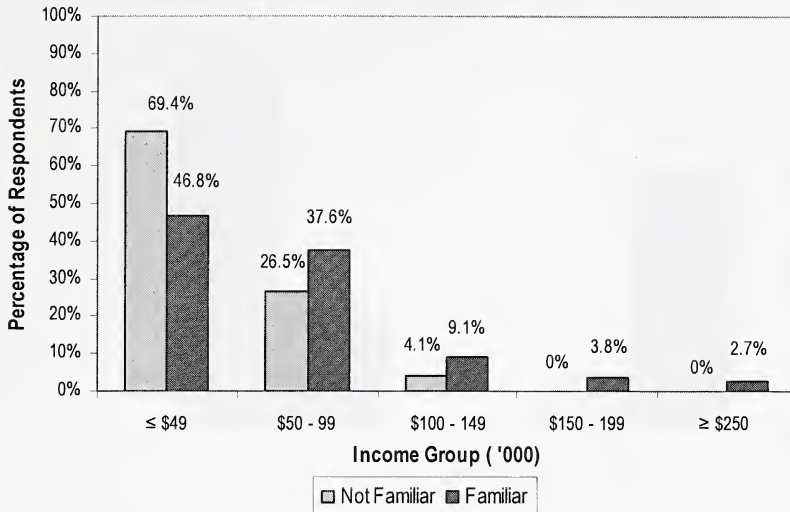


Figure 3.4-4: Level of Education of Respondents

Level of Education of Respondents Familiar & Not Familiar with Co-operatives

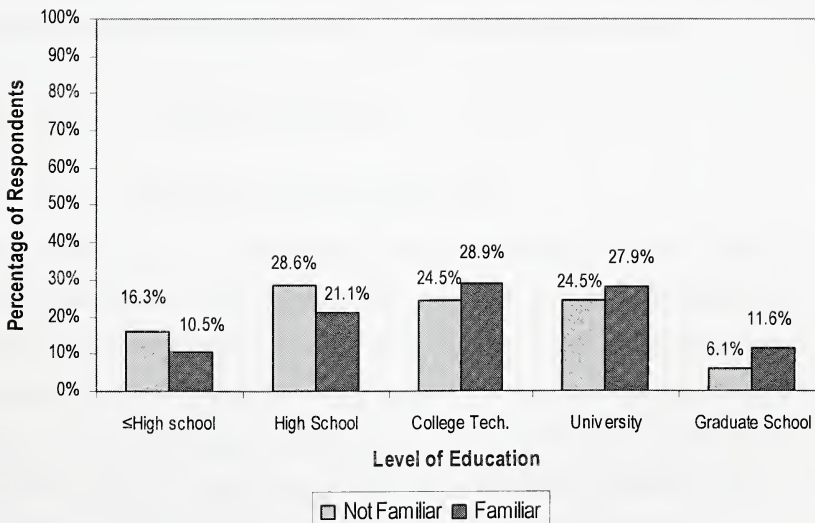
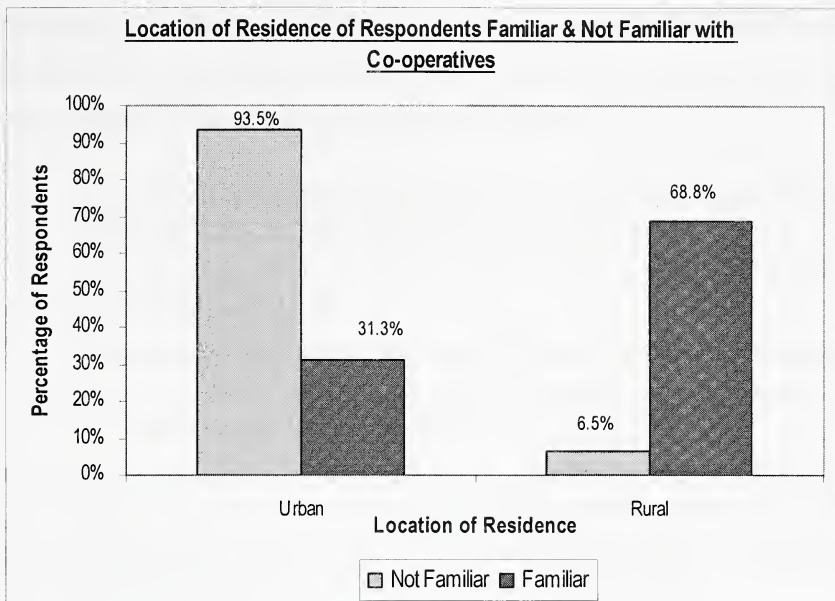


Figure 3.4-5: Residence Location of Respondents



About 80 percent of the total respondents who indicated that they were familiar with the concept of co-operatives were allowed to proceed with the rest of the questionnaire. Knowledge scores will be calculated for those who are familiar and the respondents who are not familiar are assumed to have a knowledge score of zero.

3.5 Analytical Methods

3.5.1. Calculation of Knowledge Score

Knowledge score was calculated from the overall data collected (Table 3.5-2), before the respondents who were not familiar with, and do not understand the concept of co-operatives were dropped from the sample. The calculation of knowledge score is based on the answers provided by respondents to the six questions asked about their familiarity with and understanding of the concept of co-operatives. The first part of the question required a true or false answer. The respondents that indicated lack of knowledge and familiarity with co-operatives were scored zero. These questions were asked to elicit respondents' knowledge about the concepts/principles of co-operatives. The first part of

the question required a true or false answer. The second part of the question asked about the sureness of the true or false response given in the first part. Respondents were provided with seven options ranging from 1 (Not sure at all) to 7 (Absolutely sure) as show in figure 3.3-1. The six statements are as follows:

1. A co-operative is a form of business that provides a service to its members for the purpose of meeting economic, social and cultural needs;
2. A co-operative refers to an association formed to enable its members to buy or sell to better advantage;
3. Equity in a co-operative appreciates in value and behaves as investment;
4. In a co-operative, surplus earnings are distributed to the members according to their patronage of the co-operative;
5. In a co-operative at the local level, control is linked to member-owners. Each member has only one vote, regardless of the amount of equity he or she holds;
6. Co-operatives keep money in the local economy since surpluses mainly go to members living in the community, not to distant investors.

A summary of the responses is provided in Table 3.5-1 and the details are shown in Appendix.1, (1-3 (Not Sure), (4 (Indifferent), and (5-7 (Sure). The table shows that at least 73 percent of the total respondents are familiar with, and they understand the concepts/principles of co-operatives. In four of the belief statements, over 90 percent of the respondents indicated the 'true' choice of response. The lowest percentage for the sureness of their indicated response is 71 percent. This is the response to the knowledge statement on the principle of 'one person one vote' regardless of the amount of equity. The percentage of respondents who were indifferent to the sureness of their answers was lower than 10 percent in each of the questions. These can be interpreted as an indication that most respondents are quite sure of their choice of answer, whether true or false. Overall, this is also an indication that most of the respondents are quite familiar with, and understand the concept of co-operatives. However the degree of sureness of their answers varies widely within the seven choices of answers provided on the Likert scale, and this will be reflected in the model analysis.

Table 3.5-1: Familiarity with and Understanding the Concept of Co-operatives

Familiarity & Understanding Statements	Response			Sureness of the Response Given			
	<i>TRUE (+1)</i>	<i>FALSE (-1)</i>	<i>TOTAL</i>	Not Sure	Indifferent	Sure	<i>TOTAL</i>
1. Purpose of formation	182 94.30%	11 5.70%	193	15 7.90%	9 4.70%	166 87.30%	190 100%
2. Advantage	173 91.10%	17 8.90%	190	12 6.30%	4 2.10%	176 91.70%	192 100%
3. Equity behaves like IOFs	138 72.60%	52 27.40%	190	22 11.50%	14 7.30%	155 81.20%	191 100%
4. Patronage distribution	183 96.30%	7 3.70%	190	14 7.40%	7 3.70%	169 88.90%	190 100%
5. One member one vote	167 89.30%	20 10.70%	187	44 23.40%	11 5.90%	133 70.70%	188 100%
6. Money back to local economy.	173 91.10%	17 8.90%	190	17 9.00%	6 3.20%	167 87.90%	190 100%

Process of Calculation of Knowledge Score

In order to calculate knowledge score values, the true or false part of the question was coded 1 for True or -1 for False. The -1 code was assigned to the ‘false’ response because a zero code would result in inability to capture effect of the sureness of false option. The zero code was assigned to respondents who are not familiar or knowledgeable about co-operatives. Respondents who chose to answer the ‘false’ option were asked to rate the sureness of their ‘false’ response. The respondents were provided with 7 choices of answers on the Likert scale. Each of the response options reflects the level of sureness of their perceptions about co-operatives. These choices were 1 (Not sure at all), 2 (Slightly not sure), 3 (Not sure), 4 (Indifferent), 5 (Sure), 6 (Slightly sure), and 7 (Absolutely sure). The respondents who are not familiar with co-operatives are assumed to have a zero percent knowledge score.

For the analysis, each of the seven responses is accorded a weight as shown in C_j below.

$$(A_i \in \{-1, 1\}; C_j \in \left\{ \begin{array}{l} 1 \text{ (Not sure at all), } 2 \text{ (Slightly not sure),} \\ 3 \text{ (Not sure), } 4 \text{ (Indifferent), } 5 \text{ (Sure),} \\ 6 \text{ (Slightly sure), and } 7 \text{ (Absolutely sure).} \end{array} \right\}).$$

$(A_i \in \{-1,1\}; C_j \in \{0.00, 0.17, 0.33, 0.50, 0.67, 0.83, 1.00\})$.

$$KnScore = \left\{ \left[\sum_{i=1}^6 (A_i \times C_j) \right] \div 6 \right\} \times 100$$

A_i (1 and -1) was multiplied by the chosen sureness response values. Such that weights for each of the responses are distributed accordingly:

1 = 0.00, 2 = 0.17, 3 = 0.33, 4 = 0.50, 5 = 0.67, 6 = 0.83, 7 = 1.00.

An average of all the values of the six questions was calculated for each respondent by $A_i \times C_j$ and the results are the knowledge scores in percentages (Verdurme and Viaene 2003). Figure 3.5-1 depicts the result of the distribution of the respondents' knowledge scores about familiarity and understanding of co-operatives, which is calculated on an individual basis. It shows that a fair number of the respondents have a fair but not an overwhelming knowledge of co-operatives. There were some respondents who were not knowledgeable at all. The overall average knowledge score was 62 percent, with values ranging between -22.33 to 100 percent.

Figure 3.5-1: Knowledge Scores About Familiarity and Understanding of Co-operatives

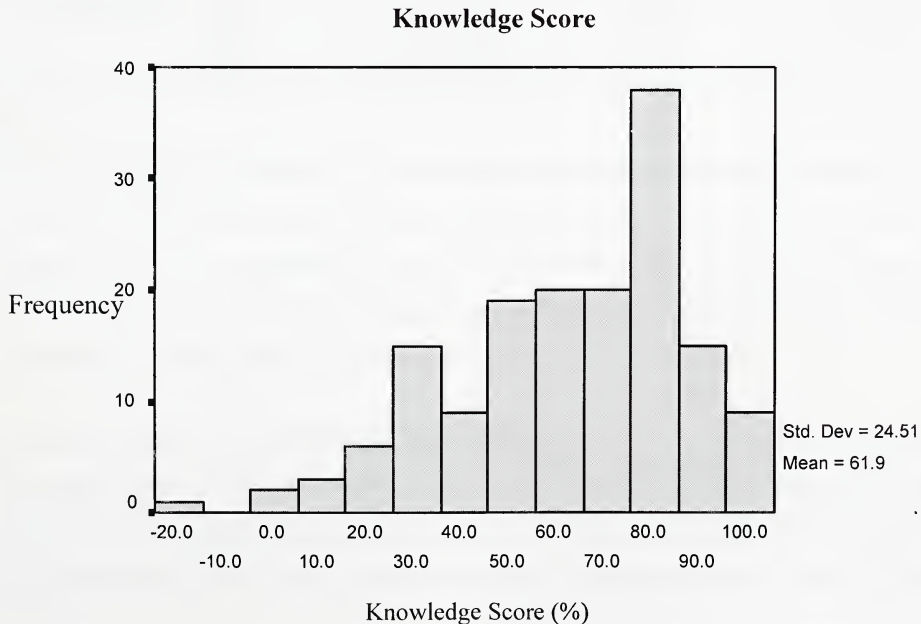


Table 3.5-2: Crosstabulation of Respondent's Knowledge Score Vs. Demographics

Variables	Groups	N	%	Mean Knowledge Score (%)
AGE	≤ 20	3	0.0%	0.00
	21-34	33	9.8%	35.4
	35-44	35	14.8%	50.0
	45-54	65	29.2%	53.3
	≥ 55	108	46.2%	50.8
	Total	244	100%	48.6
GENDER	Female	85	31.9%	44.2
	Male	159	68.1%	50.4
	Total	244	100%	48.2
INCOME (' 000)	≤ \$49	122	47.3%	44.4
	\$50 - 99	83	37.5%	51.7
	\$100 -149	20	8.6%	49.0
	\$150 -199	7	3.2%	51.5
	≥ \$250	5	3.4%	78.9
	Total	237	100%	48.3
EDUCATION	≤High School	29	10.2%	41.2
	High School	54	24.4%	53.1
	College Tech.	67	29.6%	52.0
	University	66	27.0%	48.1
	Graduate School	25	8.9%	41.9
	Total	241	100%	48.8
RESIDENCE	Urban	179	71.6%	46.8
	Rural	54	28.4%	61.5
	Total	233	100%	50.2

Table 3.5-2 shows that the 45-54 years old age group has the highest knowledge score of a level of 53.3 percent, on the contrary, respondents younger than 20 years old scored the lowest of zero. The respondents in the 35-44 years old and over 55 years old age groups have about the same level of knowledge score, which is about 50 percent each. Generally, respondents younger than 35 years old have lower knowledge scores.

In terms of gender, the males have higher knowledge score than females. The pattern of knowledge score of the income level groups shows that the higher the levels of income before tax of the respondents, the higher the knowledge scores. Respondents in the over \$250,000 annual income level group have highest knowledge score of about 79 percent.

The lowest income group is the less than \$49,000 earners, and they have the lowest knowledge score of 44 percent.

Respondents with high school qualification or higher have higher knowledge scores on average, than those with less than high school qualification. After this point, the rate of knowledge score starts to drop as the respondents' education qualification increases. University degree holders have lower knowledge scores than respondents with college qualifications. Graduate degree holders scored 7 percent lower than the university degree holders.

Rural dwelling respondents have at least 15 percent higher knowledge scores on co-operatives than the urban dwellers.

The analysis shows that overall, the most knowledgeable class of respondents are those older than 35 years, male, earning more than \$50,000 annual income before tax, with at least high school qualification, and dwelling in the rural areas.

3.5.2. Factor Analysis

Factor analysis is a generic name for a group of multivariate statistical methods whose primary purpose is to define the underlying structure of a set of variables, by reducing a set of variables, measures or items to a smaller set of common factors (Hair et al 1995). The term Factor Analysis was first introduced by Thurstone (1931). It examines the correlations among the attributes to identify the basic dimensions. Although factor analysis uses an advanced form of correlation, it differs from normal correlation analysis in that there is no dependent variable. All variables are evaluated simultaneously (Bischoff, 1998:92). It relies on the assumption that there are only a few basic dimensions that underlie the attribute ratings.

The objective of the factor analysis is to generate the first factors that explain the maximum variance. The first factor is generated with its associated fixed loading. Factor analysis then locates a second factor that maximizes the variances it explains, and so on. Factor analysis can help researchers to determine the redundant variables, and original

variables are transformed into new, non-correlated variables, called factors. The important strength of the factor analysis is that it can identify the underlying constructs in the data and can reduce the number of variables to a more manageable set (SPSS 1999). The greatest limitation of factor analysis is that it is a highly subjective process (Aaker et al. 1999).

Overall, factor analysis is generally considered effective if the total variance explained by the selected factors exceeds 70 percent, and should not be reported if otherwise (Sudman and Blair 1998). According to Sudman and Blair (1998) the key descriptive results obtained from a factor analysis are the eigenvalues¹⁸ and factor loadings, while in some instances factor scores are calculated. When discussing the significance of factor loadings, Hair et al (1998) cite loadings of +.4 as more important, and +.5 or greater as practically significant. In the interpretation process, as a rule of thumb, variables with loadings less than 0.5 are ignored.

Principal component analysis (PCA) is a key method in factor analysis, where a number of (possibly) correlated variables can be transformed into a (smaller) number of uncorrelated variables called principal components.

3.5.3. Principal Component Analysis

Principal component analysis is most common in market research application (Sudman and Blair, 1998). It is concerned only with the variance shared among all the variables (Aaker et al. 1998), and it is based on the total information in each variable.

¹⁸ Eigenvalue represents the sum of the square of the factor loading of each variable on a factor. This is the amount of variance in the original variables that is associated with a factor

The extraction of principal component amounts to a variance maximizing (varimax¹⁹) rotation of the original variable space. The orthogonal Principal Components Extraction with Varimax Rotation Method produced unobservable random variables called factors, which describes the variation among many variables (Jobson 1992). The variance is explained by the common factors and is usually referred to as the communality. All the covariance or correlations are explained by the common factors. Only common factors contribute to the co-variation among the observed variables (Kline 1994). When a satisfactory factor solution has been derived, some meaning must be assigned to each factor, which involves substantive interpretation of the pattern of factor loading of the variables (Hair et al. 1995).

Principal components analysis was carried out on the belief statements (shown in Table 3.5-3) with the goal of reducing the number of variables into a smaller number of categorical factors. The purpose is to make the total numbers of variables easier to manage, and with a minimal loss of the information contained in the original variables using the varimax method. PCA extracted ‘common factors’ from the seventeen belief statements by reducing the number of variables to a few underlying constructs, from seventeen variables to six major components/factors. Meanings were assigned to each of the six factors as shown in Table 3.5-4

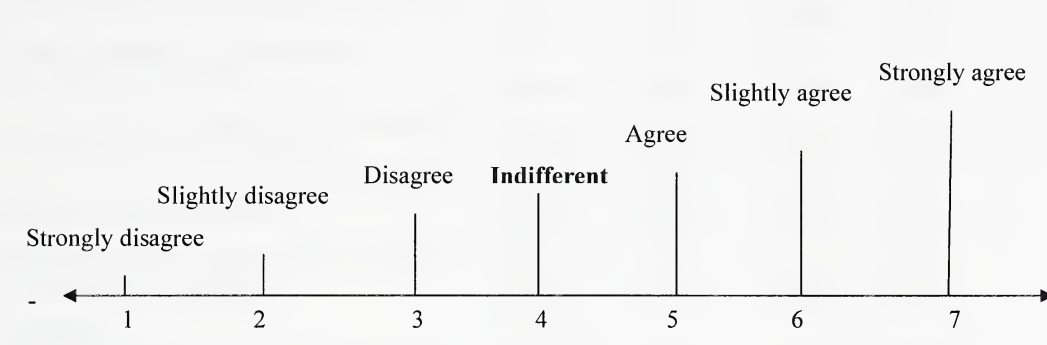
At the end of the analysis, the computer generates factor scores for each respondent based on the choice of answers provided. These six new factor score values are then included in regression instead of the original seventeen variable values. An illustration is shown below:

The score for the j th factor for respondent k , is estimated as:
$$F_{jk} = \sum_{j=1}^P W_{jk} X_{ik} .$$

¹⁹ Method of rotation used for producing orthogonal factors that approach the simple structure objective (Jobson 1992), and is the most widely used method of factor rotation. The aim is to maximize the sum of variances of squared loading in the columns of the factor matrix. This produces in each column, a loading that is either high or near zero (Kline 1994). These rotations are used in principal component analysis so that the axes are rotated to a position in which the sum of the variances of the loadings is the maximum possible.

where X_{ik} is the standardized value of the i^{th} variable for case k and W_{jk} is the factor score coefficient for the j^{th} factor and the i^{th} variable. Estimated component scores are included in the regression analysis to help estimate predicted and marginal probabilities of choosing one of the options presented. Responses are measured using 1-7 Likert scale as illustrated below.

Figure 3.5-2: Likert Scale for Belief Statements



A complete list of the seventeen belief statements is provided in Appendix 2 where they are listed in the order they were asked in the questionnaire. Table 3.5-3 below shows a summary of the responses provided by the respondents, and the details are presented in Appendix 3. The questions were structured to solicit the beliefs of the respondents about co-operatives.

Table 3.5-3: Classification of Responses to Belief Statements about Co-operatives.

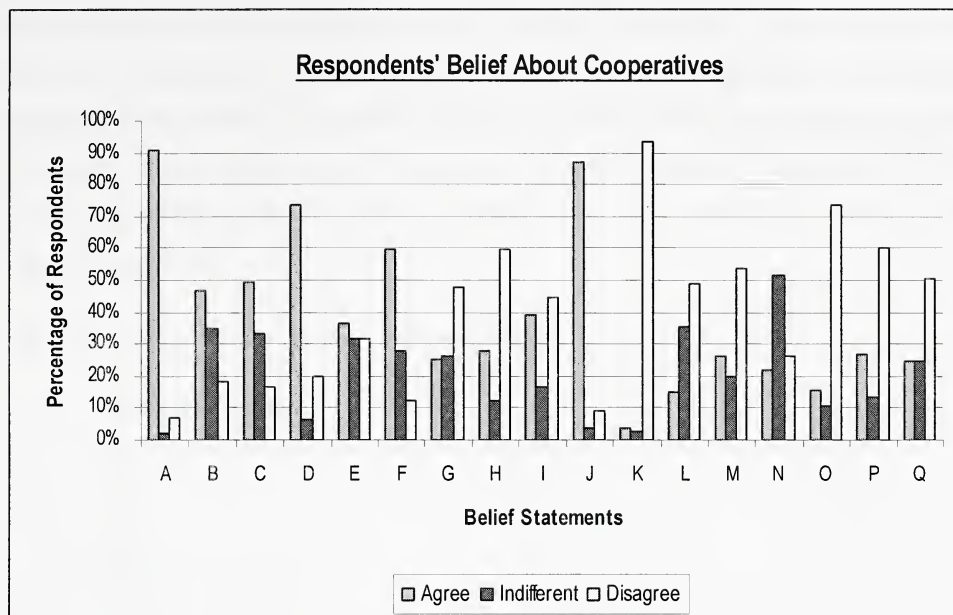
Belief Statements	Level of Agreement with Belief Statement			
	Disagree	Indifferent	Agree	Total
<u>Agree</u>				
Belief a. A co-operative is a group of people doing business	13 6.90%	4 2.10%	173 91.00%	190 100%
Belief j. Banks in Canada are making too much money	17 9.10%	7 3.70%	164 87.20%	188 100%
Belief d. Credit Unions (CU) are very similar to banks	38 20.10%	12 6.30%	139 73.60%	189 100%
Belief f. Co-operatives are more involved in community services than IOFs	23 12.30%	53 28.20%	112 59.50%	188 100%
Belief c. In terms of advantages, doing business with a co-operative is better than with an IOF	31 16.90%	61 33.30%	91 49.70%	183 100%
Belief b. In terms of profits, doing business with a co-operative is better than with an IOF	33 18.10%	64 35.00%	86 47.00%	183 100%
Belief e. IOFs provide a greater number of products and services than co-operatives	58 31.60%	58 31.70%	67 36.60%	183 100%
<u>Indifferent</u>				
Belief n. The sale of Agricore and Dairyworld shakes my confidence in co-operatives	48 26.10%	95 51.60%	41 22.30%	184 100%
<u>Disagree</u>				
Belief k. I did not know that co-operatives /credit unions existed	175 93.60%	5 2.70%	7 3.80%	187 100%
Belief o. There is no difference between large co-operatives and large private companies	137 73.60%	20 10.80%	29 15.60%	186 100%
Belief p. In order for credit unions to compete with banks, they will have to become more like banks, thus destroying their original distinction	112 60.00%	25 13.40%	50 26.70%	187 100%
Belief h. I have heard about co-operatives/credit unions but I am not familiar with the way they work	109 59.80%	22 12.10%	51 28.00%	182 100%
Belief m. Credit Unions are less efficient than banks because they cannot operate nationwide	101 53.50%	38 20.10%	50 26.50%	189 100%
Belief q. Banks offer better financial product/services than Credit Union	95 50.30%	47 24.90%	47 24.90%	189 100%
Belief l. Eventually co-operatives as business enterprises will become publicly traded firms (IOFs)	89 48.90%	65 35.70%	28 15.30%	182 100%
Belief g. Co-operatives should worry more about profits than about social issues	88 47.80%	49 26.60%	47 25.50%	184 100%
Belief i. Businesses should pay more attention to environmental issues than creating economic growth and employment	84 44.50%	31 16.40%	74 39.20%	189 100%

Table 3.5-3 above shows that the initial 7 point Likert scale options shown in Figure 3.5-3 are re-classified into 3 main categories, namely, disagree, indifferent and agree. The first three categories are classified as disagree (1-3), indifferent (4) was left the same and the last three classified as agree (5-7). This summarized data as presented, shows that an overwhelming 91 percent of the respondents agree with the statement that a co-operative is a group of people doing business, and over 87 percent believe that banks in Canada are making too much money. Almost 74 percent of the respondents agree that Credit Unions are very similar to banks. About 60 percent believe that co-operatives are more involved in community services than IOFs. Almost fifty percent of the respondents also agree that that in terms of profits, doing business with a co-operative is better than with an IOF and that Credit Unions (CU) are very similar to banks respectively.

Over half of the respondents were indifferent to the belief statement that the sale of Agricore and Dairyworld shook their confidence in co-operatives. About one third of the respondents are also indifferent to the belief statements that in terms of profits and advantages, doing business with a co-operative is better than with an IOF. The same percentage of respondents is indifferent to the belief statement that businesses should pay more attention to environmental issues than creating economic growth and employment.

In contrast, almost 94 percent of the respondents disagreed that they did not know that co-operatives /credit unions existed, meaning that there is a very high rate of awareness about co-operatives. 74 percent disagreed that there is no difference between large co-operatives and large private companies. Sixty percent of the respondents also disagreed that they have heard about co-operatives/credit unions but they are not familiar with the way they work, and do not believe that in order for credit unions to compete with banks, they will have to become more like banks, thus destroying their original distinction. About 50 percent disagreed that credit unions are less efficient than banks because they cannot operate nationwide, that banks offer better financial product/services than credit unions, co-operatives should worry more about profits than about social issues, and that businesses should pay more attention to environmental issues than creating economic growth and employment. The figures below shows the plot of the distribution of the responses showed in Table 3.5-3

Figure 3.5-3: Distribution of Responses to Belief Statements about Co-operatives.



Principal Component Analysis Output

The eigenvalues were obtained (Table 3.5-4). The result of the calculation yielded six new variables used in the model analysis. These factors are from 1 to 6 (FACT 1_1 to FACT 1_6 or Components 1-6 as presented below in Table 3.4-3.

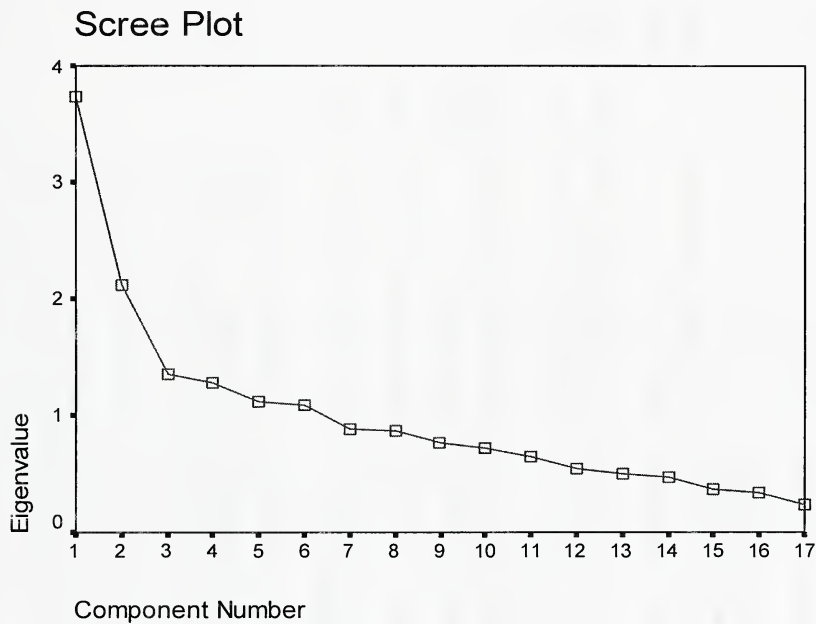
Table 3.5-4: Total Variance Explained

<i>Component</i>	<i>Eigenvalues</i>		
	<i>Total</i>	<i>% of Variance</i>	<i>Cumulative %</i>
1	3.739	21.992	21.992
2	2.116	12.445	34.437
3	1.349	7.935	42.373
4	1.272	7.484	49.857
5	1.118	6.577	56.433
6	1.093	6.427	62.86

The total variance explained by the selected factors was 62.86%, although it is below the 70% generally considered effective.

The Scree Plot is presented in Figure 3.5-5 below. The plot has two lines: the lower line shows the proportion of variance for each principal component, while the upper line shows the cumulative variance explained by the first N components. The principal components are sorted in decreasing order of variance, so the most important principal component is always listed first. The x axis contains the Principal Components sorted by decreasing fraction of total variance explained. The y axis contains the fraction of total variance explained.

Figure 3.5-4: Scree Plot of Principal Component Analysis



The result of the Rotated Component Matrix is presented in Table 3.5-5 below where the component values were used to categorize the statements into the appropriate factors. Statements with less than 0.50 were not considered, hence beliefs n and o were not included in the factors. Factor 1 has 6 belief statements, factor 2 has 4 belief statements, factor 3 has 4 belief statements, and factors 4 to 6 each have one belief statement. These factors were used in the regression analysis.

Table 3.5-5: Rotated Component Matrix

Beliefs	Belief Statements	FACTORS						Communalities	
		1	2	3	4	5	6		
1. Financial beliefs									
e	IOFs provide a greater number of products and services than co-ops	1						0.646	
g	Co-operatives should worry more about profits than about social issues	0.538						0.534	
m	Cr. Unions are less efficient than banks because they cannot operate nationwide	0.796						0.639	
p	In order for credit unions to compete with banks, they will have to become more like banks, thus destroying their original distinction	0.657						0.577	
q	Banks offer better financial product/services than Credit Union	0.623						0.673	
n	The sale of Agricore and Dairyworld shakes my confidence in co-operatives	0.427						0.512	
2. Economic and social responsibility belief									
b	In terms of profits, doing business with a co-operative is better than with an IOF		2					0.721	
c	In terms of advantages, doing business with a co-operative is better than with an IOF		0.679					0.734	
f	Co-operatives are more involved in community services than IOFs		0.825					0.702	
i	Businesses should pay more attention to environmental issues than creating economic growth and employment		0.492					0.621	
3. Awareness about co-operatives beliefs									
h	I have heard about co-ops/credit unions but I am not familiar with the way they work			3				0.718	
l	Eventually co-operatives as business enterprises will become publicly traded firms (IOFs)			0.538				0.567	
k	I did not know that co-operatives /credit unions existed			0.603				0.478	
o	There is no difference between large co-operatives and large private companies			0.449				0.546	
4. Similarity of Credit Unions and banks belief									
d	Credit Unions (CU) are very similar to banks				4				
5. Capitalistic characteristic									
					0.832			0.706	
6. Definition of co-operatives									
j	Banks in Canada are making too much money					5			
a	A co-operative is a group of people doing business					0.877	6		
							0.711	0.536	

Extraction Method: Principal Component Analysis.
Normalization.

Rotation Method: Varimax with Kaiser

4.0 Theoretical and Empirical Framework

This chapter presents the economic modeling of the respondents' perceptions, attitudes and beliefs towards co-operatives and co-operative membership. In the analysis, the behavior of respondents to co-operatives is typically disaggregated, implying that the models represent the choice behavior of the individual respondents. Discrete choice analysis is then used to analyze and predict behavioral decisions. Consequently, this chapter begins with a review of the theoretical and practical aspects of discrete choice models. It proceeds with a brief discussion of the random utility model, which is the most common theoretical basis of discrete choice models. The chapter is concluded by the presentation of distribution statistics of the variables.

Socioeconomic characteristics of the respondents are postulated as arguments of the indirect utility function that explain variation in choices. Multinomial logit (MNL) analysis and ordered probit analysis will be used in the analysis.

4.1 Discrete Choice Models and Random Utility Theory

4.1.1. An Overview of Discrete Choice Models

The theoretical framework for the selection process in discrete choice models is such that an individual will choose a choice that provides the maximum utility or satisfaction. Therefore, the probability of choosing A equals the probability that the utility derived from A is greater than the utility derived from each of the other available options, given all available options.

Drawing from the works of Ben-Akiva and Lerman (1985), four general assumptions are used to present the framework of discrete choice models. These assumptions are based on the decision-maker and his/her characteristics; the alternative options available to the decision-maker; attributes which measures the costs and benefits of an alternative; and decision rule which describes the process the decision-maker used in choosing an alternative. Heterogeneity of preferences among decision-makers is assumed, which in this case is the individual respondent, thus requiring a disaggregated model. This is to

include their individual characteristics such as the socio-economic variables of age, gender, education and income. For alternatives, assumptions are made about the available choice set that a respondent considers during a choice process. A discrete choice set contains a finite number of alternatives that are explicitly listed. Each alternative in the choice set is characterized by a set of attributes; some attributes are generic and some are alternative-specific. An attribute is not necessarily a directly measurable quantity as it can be any function of available data. The decision rule is the process used by the decision-maker to evaluate the attributes of the alternatives in the choice set and determine a choice.

4.1.1.1 Utility Theory

Utility theory assumes that the decision-maker's preference for an alternative is captured by a value, called utility, and the decision-maker selects the alternative in the choice set with the highest utility. This concept is employed by consumer theory of micro-economics and it presents strong limitations for practical applications. The underlying assumptions of this approach are often violated in decision-making experiments. The complexity of human behavior suggests that the decision rule should include a probabilistic dimension (Ben-Akiva and Lerman 1985). Random utility models, used intensively in econometrics and behavior analysis, are based on deterministic decision rules, where utilities are partially represented by random variables.

4.1.1.2 Random Utility Theory

Economic consumer theory assumes that the decision-maker has a perfect discrimination capability, the same goes for random utility models. However, uncertainty must be taken into account because it is assumed the analyst has incomplete information. Manski (1977) identifies four different sources of uncertainty: unobserved alternative attributes; unobserved individual characteristics (also called "unobserved taste variations"); measurement errors; and proxy, or instrumental, variables. Utility in this case is modeled as a random variable in order to reflect this uncertainty. To account for these unobservables, an error term is included in the utility function, making utility itself a

random variable (Manski 1977). With utility now a random variable, one can explore utility, and therefore choices, in a probabilistic sense

Therefore, following Ben-Akiva and Lerman (1985), the utility U_m that individual n associates with alternative i in the choice set C_n is represented by

$$U_m = V_m + \varepsilon_m \quad 4.1-1$$

where V_m is the deterministic (or systematic) part of the utility, and ε_m is the random term, capturing the uncertainty. The alternative with the highest utility is chosen. Therefore, the probability that alternative i is chosen by decision-maker n from choice set C_n is

$$P(i / C_n) = P[U_m \geq U_{jn} \forall j \in C_n] = P\left[U_m = \max_{j \in C_n} U_{jn}\right] \quad 4.1-2$$

According to Ben-Akiva and Lerman (1985), the following assumptions are necessary for utility model to be operational. First, *location and scale parameters*, we assume that α and μ , are two arbitrary real numbers where $\mu > 0$, such that

$$P[U_m \geq U_{jn} \forall j \in C_n] = P[\mu U_m \geq \mu U_{jn} + \alpha \forall j \in C_n] = P[U_m - U_{jn} \geq 0 \forall j \in C_n] \quad 4.1-3$$

This illustrates the fact that only the signs of the differences between utilities are relevant here, and not utilities themselves, therefore the concept of ordinal utility is relative and not absolute. To estimate and use a specific model, arbitrary values will be selected for α and μ . The selection of the scale parameter μ is usually based on a convenient normalization of one of the variances of the random terms. The location parameter α is usually set to zero.

Secondly, in *alternative specific constants*, a nonrestrictive assumption is made that the mean of the random terms is equal to any convenient value c (usually zero). The mean of the error term of alternative i is denoted by $m_i = E[\varepsilon_m]$, we can define a new random variable $e_m = \varepsilon_m - m_i + c$ such that $E[\varepsilon_m] = c$. We would then have

$$P[U_{in} \geq U_{jn} \forall j \in C_n] = P[V_{in} \geq m_i + e_{in} \geq V_{jn} + m_j + e_{jn} \in C_n] \quad 4.1-4$$

A model in which the deterministic part of the utilities are $V_{in} + m_i$, the random terms are e_{in} (with mean c), m_i are then included as Alternative Specific Constants (ASC) which captures the means of the random terms. It may then be assumed without loss of generality that the error terms of random utility models have a constant mean c by including alternative specific constants in the deterministic part of the utility functions.

From a modeling viewpoint, the choice of the particular alternative whose ASC is constrained is arbitrary. However, Bierlaire, Lotan and Toint (1997) have shown that the estimation process may be affected by this choice. In the context of the Multinomial Logit Model, they show that constraining the sum of ASCs to 1 is optimal for the speed of convergence of the estimation process.

The third assumption is that, *the deterministic term of the utility* V_{in} of each alternative is a function of the attributes of the alternative itself and the characteristics of the decision-maker, which is $V_{in} = V(z_{in}, S_n)$ 4.1-5

where z_{in} is the vector of attributes as perceived by individual n for alternative i , and S_n is the vector of characteristics of individual n . This formulation is simplified using any appropriate vector valued function h that defines a new vector of attributes from both z_{in} and S_n , that is

$$x_{in} = h(z_{in}, S_n) \quad 4.1-6$$

The choice of h is very general, and several forms may be tested to identify the best representation in a specific application. It is usually assumed to be continuous and monotonic in z_{in} . For a linear in the parameters utility specification, h must be a fully determined function which does not contain unknown parameters. Then we have $V_{in} = V(x_{in})$

It is assumed that a linear parameters function V_{in} is

$$V_{in} = \sum_k \beta_k x_{ink} = \beta' x_{in} + \alpha'_j x_n + \varepsilon_{in} \quad 4.1-7$$

The deterministic term of the utility is therefore fully specified by the vector of parameters β

The last fourth assumption is based on *the random part of the utility*. The original formulation of RUM²⁰ as a behavioral model followed the economists' theory of consumer behavior, with features of the taste template that were heterogeneous across individuals and unknown to the analyst, as well as unobserved aspects of experience and of information on the attributes of alternatives, interpreted as random factors (McFadden, 2000). The random components of the utility function are independently and identically Weibull distributed (McFadden, 1974). It stems from the assumption that the disturbances are independent and homoskedastic and such, the log odds ratio of any two alternatives is independent of the utilities of other alternatives (Green, 2003).

4.2 The Logit and Probit Models

As introduced by Gumbel (1958), logit models are based on a probability distribution function of the maximum of a series of random variables. Probit models are based on the normal distribution motivated by the Central Limit Theorem. The main advantage of the Probit model is its ability to capture all correlations among alternatives. The Logit model has been much more popular, because of its tractability, but it imposes restrictions on the covariance structure. Its generalization to more than two alternatives is referred to as the Multinomial Logit Model (Ben-Akiva and Bierlaire 2003).

4.2.1. Multinomial Logit (MNL) Analysis

A multinomial logit model (MNL) can be used to estimate the probability of choosing one of the alternatives as the most preferred as against the others. The multinomial logit model has for many years provided the fundamental platform for the analysis of discrete choice. The estimation of the MNL model requires the normalization of one of the parameter sets in order to secure the identification of the model parameters (Greene 2003, Chapter 21). As such, the probability of choosing an alternative by the respondent can be estimated by the multinomial logit model (Greene 2003, p. 721) as shown:

²⁰ Random Utility Model

$$\text{Prob}(Y_i = j) = \frac{e^{\beta_j' x_i}}{\sum_{k=1}^J e^{\beta_k' x_i}}, \quad j = 0, 1, 2. \quad 4.2-1$$

The estimated equations provide a set of probabilities for the $J + 1$ choices for a decision maker with characteristics X_i . $\text{Pr}(j)$ is the probability of the choice of a particular response, as choice response j ; X_i is a set of demographic variables of the respondent, and β_j is a vector of unknown parameters Huang and Fu (1995). It is a set of observable characteristics which enter the model for each observation. The assumption here that alternative ranked “1” is chosen as against the other alternatives. There may be no such covariates, in which case, the only element in β_j would be the constant term, “1” and the latent class probabilities would be simple constants which, by construction, sum to one.

The sign and magnitude of coefficients estimated from the MNL model are not straightforward to interpret (Huang and Fu 1995). The sign of the estimated coefficient does not necessarily indicate the increase or decrease in the probability of choosing the j^{th} alternative. Predicted probability of choosing alternative j can be estimated.

The probabilities are as follows:

$$\text{Prob}(Y_i = j | x_i) = \frac{e^{\beta_j' x_i}}{1 + \sum_{k=1}^J e^{\beta_k' x_i}} \quad j = 0, 2, \dots, J, \beta_0 = 0 \quad 4.2-2$$

$\beta_0 = 0$ is the convenient normalization that solves the problem. The j log-odds ratios are computed as:

$$\ln \left[\frac{P_{ij}}{P_{ik}} \right] = x_i' (\beta_j - \beta_k) = x_i' \beta_j \quad \text{if } k = 0. \quad 4.2-3$$

4.2.1.1 Independence of Irrelevant Alternatives (IIA)

An important property of the Multinomial Logit Model (MNL) is Independence from Irrelevant Alternatives (IIA) This states that the ratio of the probabilities of any two

alternatives is independent of the choice set, in other words, is unaffected by the systematic utilities of any other alternatives (Green, 2003). That is, for any choice sets C_1 and C_2 such that $C_1 \subseteq C_n$ and $C_2 \subseteq C_n$ and for any alternatives i and j in both C_1 and C_2 , we have

$$\frac{P(i/C_1)}{P(j/C_1)} = \frac{P(i/C_2)}{P(j/C_2)}. \quad 4.2-4$$

4.2.1.2 The Marginal Effects

The marginal effect of a variable is the change in the dependent variable Y for a given change in an explanatory variable X . It measures the shift in the probability of an outcome with respect to change in a given regressor. In the multinomial logit model marginal effects are computed at the sample means of the observations. According to Green (2003), the marginal effects of the characteristics on the probabilities can be represented as

$$\delta_j = \frac{\partial P_j}{\partial X_j} = P_j \left[\beta_j - \sum_{k=0}^J P_k \beta_k \right] = P_j \left[\beta_j - \bar{\beta} \right] \quad 4.2-5$$

Every sub vector of β enters every marginal effect, both through the probabilities and through the weighted average that appears in δ_j . Marginal effects then can be computed from the estimated parameters.

The sign and magnitude of coefficients estimated from the MNL model are not straightforward to interpret (Huang and Fu 1995). The sign of the estimated coefficient does not necessarily indicate the increase or decrease in the probability of choosing the j th alternative. The predicted probability of choosing alternative j are estimated and marginal effect of changes in one of the independent variables (X) on predicted probabilities can be estimated as well

Liao (1994, P:20) noted that for continuous variables, a unit change approximates a small change, thereby the partial derivative measure the marginal effect; while in the case of a dummy variable the only change is from 0 to 1 and 1 to 0, a 100 percent change. Taking the partial derivative of a dummy variable tends to overestimate the marginal effect. He suggested that a more accurate approximation of the effects of a change in a dummy variable on choice probabilities can be accomplished by looking at the changes in the predicted probability of when the analyzed variable characteristics is equal to 1 and when it is equal to 0.

4.2.2. Ordered Probit Model

An ordered probit model is a behavioral discrete choice model that is used to describe decision makers' choices among alternatives of ordered response. The ordered probit and logit models have come into fairly wide use as a framework for analyzing such responses (Zavoina and McElvey 1975). This applies to applications such as surveys, in which the respondent expresses a preference with ordinal ranking.

Each person's response is based on their individual utility, and the responses can vary. The analysis will determine if certain characteristics influence respondents' utility. To achieve this, the rankings are regressed on respondent's characteristics and other independent variables. The underlying variable that would be expressed by the respondents is continuous and unobservable. Only the values chosen as most closely representing their actual choice are observed. From the general model of the multiple-choice dependent variable (Green 2003);

$$y_i^* = \beta' x_i + \varepsilon_i, \varepsilon_i \sim F(\varepsilon_i | \theta), E[\varepsilon_i] = 0, Var[\varepsilon_i] = 1 \quad 4.2-6$$

where is y_i^* unobserved, what we observed is

$$y_i = 0 \text{ if } y^* \leq 0$$

$$= 1 \text{ if } 0 < y^* \leq \mu_1,$$

$$= 2 \text{ if } 0 < y^* \leq \mu_2,$$

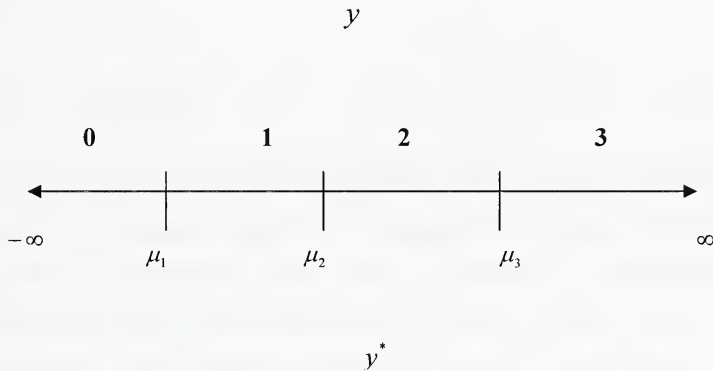
$$\vdots$$

$$= J \text{ if } y_i > \mu_{J-1}.$$

4.2-7

The μ are unknown parameters to be estimated with β . The μ_i 's represent thresholds to be estimated (along with the parameter vector β). For all probabilities are positive, we must have $0 < \mu_1 < \mu_2 < \dots < \mu_{J-1}$. Figure 4.2-1 illustrates the correspondence between the latent, continuous variable, y^* , and the observed y . We assume that ε is normally distributed across observations.

Table: Relationship between Latent and Coded Dependent Variables.



The following probabilities are obtained after normalizing the mean and variance of ε to zero and one as shown in equation 4.2-7 above:

$$Prob(y = 0 | x) = \Phi(-x' \beta),$$

$$Prob(y = 1 | x) = \Phi(\mu_1 - x' \beta) - \Phi(-x' \beta),$$

$$Prob(y = 2 | x) = \Phi(\mu_2 - x' \beta) - \Phi(\mu_1 - x' \beta),$$

$$\vdots$$

$$Prob(y = J | x) = 1 - \Phi(\mu_{J-1} - x' \beta),$$

4.2-8

For all probabilities are positive, we must have $0 < \mu_1 < \mu_2 < \dots < \mu_{J-1}$. The marginal effects of the regressors x on the probabilities are not equal to the coefficients.

$$\text{Prob}(y = 0 | x) = \Phi(-x' \beta),$$

$$\text{Prob}(y = 1 | x) = \Phi(\mu_1 - x' \beta) - \Phi(-x' \beta),$$

$$\text{Prob}(y = 2 | x) = 1 - \Phi(\mu_{J-1} - x' \beta),$$

4.2-9

For these three probabilities, the marginal effects of changes in the regressors are

$$\frac{\text{Prob}(y = 0 | x)}{\partial x} = -\phi(x' \beta) \beta,$$

$$\frac{\text{Prob}(y = 1 | x)}{\partial x} = [\phi(-x' \beta) - \phi(\mu_1 - x' \beta)] \beta,$$

$$\frac{\text{Prob}(y = 2 | x)}{\partial x} = \phi(\mu_{J-1} - x' \beta) \beta.$$

4.2-10

4.3 Summary

Underlying the question of attitude and belief in the economic decision is utility theory. In economics of consumer theory, it is assumed that consumers/customers are rational and they have preferences. They seek to optimize their objective function, given constraints. In this case, the constraints are the finite available choices from which they have to choose. Socioeconomic characteristics of the respondents are postulated as arguments of the indirect utility function that explain variation in choices. The fundamental aspects of discrete choice theory were summarized, and random utility theory, ordered probit models, and multinomial logit models were discussed.

5.0 Model Specification and Selection

5.1 The Variables

The data used in this chapter is based on respondents who indicated familiarity with co-operative concepts. They represent about 80 percent of the total respondents. Tables 5.5-1 and 5.5-2 present the list of the variables used in the model analysis. Table 5.5-1 describes the independent variables. This includes the socio-economic and demographic variables such as age, gender, income, education status, residence location, calculated knowledge score and the belief factors from Principal Component Analysis. Table 5.5-2 presents the dependent variables, which are based on four questions from the questionnaire. They are used as proxy, to elicit respondents' preferences for the answer that mostly represents their choice. These four questions were about respondents' intention to purchase from co-operatives; consideration to patronize co-operatives; patronage of co-operatives in the last 12 months; and also membership status in co-operatives.

Table 5.1-1 shows the explanatory variables. There are five answer choices for age groups, two for gender, seven for level of education, and five for annual income level group (before tax). Respondents are either located in the rural or urban residence. Knowledge score was calculated as discussed in section 3.5.1, with values ranging between -22.33 to 100 percent. Principal Component Analysis categorized the seventeen belief statements into six factors as shown in section 3.5-3 .

Table 5.1-2 shows there are three choices for membership status namely, current, former and never been members. Likert scale format with seven choice levels of answers were provided for each of two the dependent variable questions on intent to purchase from co-operatives and consideration to patronize co-operatives questions. Patronage of co-operative in the last 12 months question has three options of yes, no or might have but do not know choices, as shown in the table 5.1-2.

It should be noted that some of the variables were recoded to facilitate the efficiency of the models. The recoded variables are presented in Appendices 4 and 5.

Table 5.1-1: Independent Variables

<u>Variable</u>	<u>Description</u>
<u>Age</u>	<u>Age Categories of Respondents</u>
1	≤ 20
2	21-34 years
3	35-44 years
4	45-54 years
5	≥ 55 years
<u>Gender</u>	<u>Gender of Respondents</u>
0	Male
1	Female
<u>Education</u>	<u>Level of Education Achieved by Respondents</u>
1	No School at all
2	Grade School
3	Some High School
4	High School
5	College Tech.
6	University
7	Graduate School
<u>Income</u>	<u>Categories of Annual gross income of Respondents (before tax)</u>
1	≤ \$49
2	\$50 – 99
3	\$100 - \$149
4	\$150 - \$199
5	≥ \$250
<u>Residence</u>	<u>Location of Respondents</u>
0	Urban
1	Rural
<u>Knowledge score</u>	<u>Respondents familiarity and understanding of co-operative concepts</u>
Mean	Mean values of the scores Range -22.33 to 100
<u>Factors</u>	<u>Belief statement factors</u>
Factor 1	Financial roles beliefs
Factor 2	Economic and social responsibility belief
Factor 3	Awareness co-operatives beliefs
Factor 4	Similarity of Credit Unions and banks belief
Factor 5	Capitalistic belief
Factor 6	Definition statement belief
	<u>Codes</u>
	FAC1_2
	FAC2_2
	FAC3_2
	FAC4_2
	FAC5_2
	FAC6_2

Table 5.1-2: Dependent Variables

<i>Variable Name</i>	<i>Description</i>
PRODUCTX	<i>If it was said that product/service X (one that you buy) is provided by a co-operative organization, how would it affect your intentions towards the product?</i>
1	More inclined NOT to purchase
2	Inclined NOT to purchase
3	Slightly inclined NOT to purchase
4	Indifferent
5	Slightly inclined to purchase
6	Inclined to purchase
7	More inclined to purchase
COOPPATR	<i>Would you consider patronizing co-operative if you knew that co-operative offer good prices, good services, and quality products, contributes to the community, and offers good price discount for members?</i>
1	Extremely unlikely
2	Unlikely
3	Slightly unlikely
4	Not sure
5	Slightly likely
6	Likely
7	Extremely Likely
COOPUSE	<i>Have you used or purchased services or products of a co-operative in the past 12 months?</i>
1	Yes, I Have
2	No, I have not
3	I might, but do not know
MEMSTATUS	<i>Membership status in co-operative</i>
0	Current Member
1	Never Member
2	Former Member

5.2 Description of the Data

Overall, about eighty percent or 193 respondents indicated that they are familiar with, and understand the concept of co-operatives. Out of this number, knowledge score could be calculated for 171 (89 percent of the sample) or 70 percent of the total respondents due to incomplete responses to all the relevant questions. As a result, the final analysis of the data was carried out based on the 171 samples. The data analyzed in this study is based on the answers provided to the questions in the 'A' Part of the questionnaire. The sample statistic of the data is presented in table 5.2-1 as follows.

Table 5.2-1: Sample Statistics for Explanatory Variables (n=171)

Variable	Type	Definition	n	Mean	S.D.	Minimum	Maximum
AGE	Continuous	<i>Age of respondent</i>	171	3.97	1.04	2	5
GENDER	Binary	<i>Gender of Respondents</i>	170	0.72	0.45	0	1
EDUCAC	Discrete	<i>Level of Education of Respondents</i>	170	3.15	1.14	1	5
INCOME	Continuous	<i>Income level of respondents (\$1000's)</i>	165	1.81	0.95	1	5
RESIDENCE	Binary	<i>Location of residence of respondents</i>	167	1.28	0.45	1	2
KNSCORE	Continuous	<i>Knowledge Score</i>	171	61.99	25.66	-22.33	100
Dependent Variables							
INTENT	Discrete (Ordered)	<i>Intentions towards the product...</i>	170	5.15	1.14	1	7
COOPATR	Discrete (Ordered)	<i>Would you consider patronizing co-operative...</i>	171	6.02	1.09	1	7
COOPUSE	Discrete (Unordered)	<i>Have you used or purchased services or products...</i>	165	1.45	0.70	1	3
MSTATUS3	Discrete (Unordered)	<i>Membership Status</i>	170	0.88	0.63	0	2
Belief Factors							
FAC1_1	Financial roles beliefs						
FAC2_1	Economic and social responsibility belief						
FAC3_1	Awareness of co-operatives beliefs						
FAC4_1	Similarity of credit unions and banks belief						
FAC5_1	Capitalistic belief						
FAC6_1	Definition statement belief						

Note: S.D. = Standard Deviation

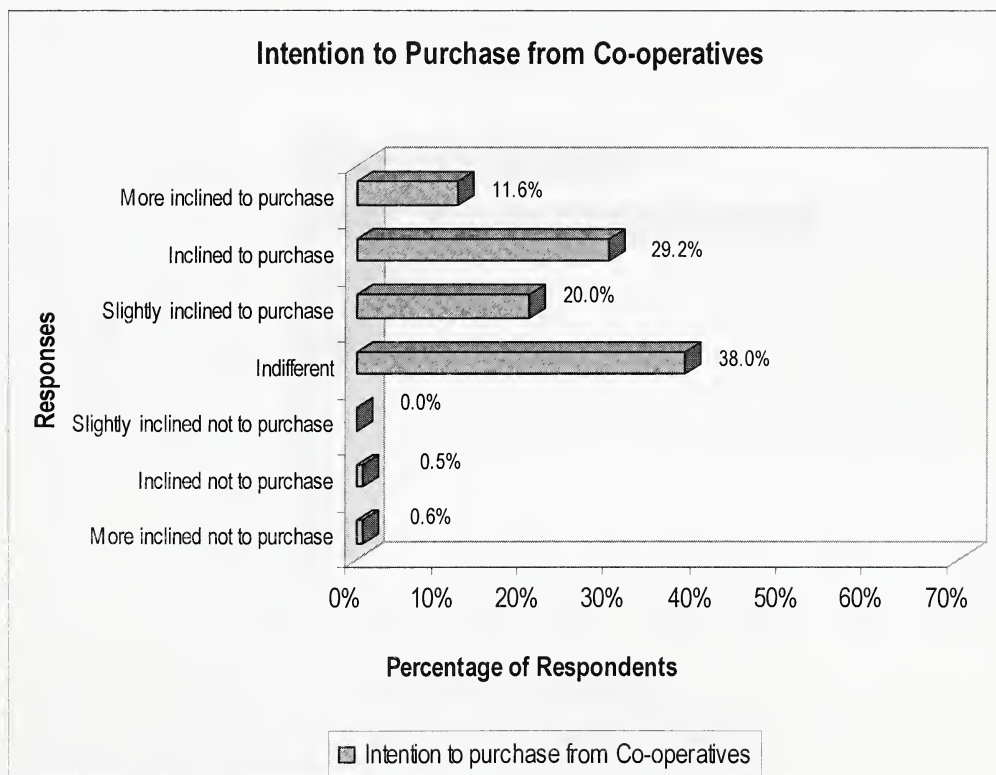
5.2.1. Description of Independent Variables

The description of the independent variables was discussed earlier, and this can be found in section 3.5 above.

5.2.2. Description of Dependent Variables

Likert scales were used to express the choice of the respondents to some of the dependent variables questions. The following plots depict the distribution of the choices of answers provided to the dependent variable questions by the respondents. A summary of these is also presented in Table 5.2-2

Figure 5.2-1: Intention to Patronize Co-operatives

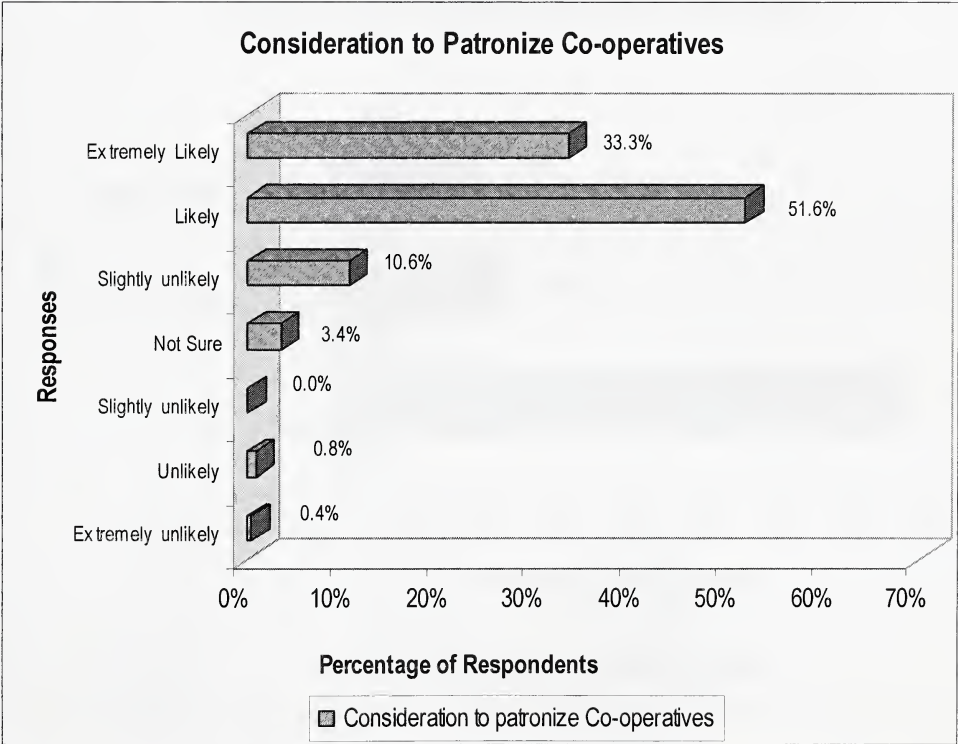


The first three choices, namely more inclined not to purchase, inclined not to purchase, and slightly inclined not to purchase, account for less than 1.5 percent of the total

responses. These responses were therefore included with the indifferent category due to the low response rates. Some 38 percent of the respondents were indifferent in their intention to patronize co-operatives. About 29 percent of them were inclined to patronize co-operatives. About 12 percent indicated that they were more inclined to patronize co-operatives.

Overall, a very low percentage of respondents are not inclined to patronize co-operatives, just above one percent. The variability in the level of intention of the respondents to patronize co-operatives formed the basis for further model analysis despite the low percentage of respondent who are not inclined to patronize co-operatives.

Figure 5.2-2: Consideration to Patronize Co-operatives

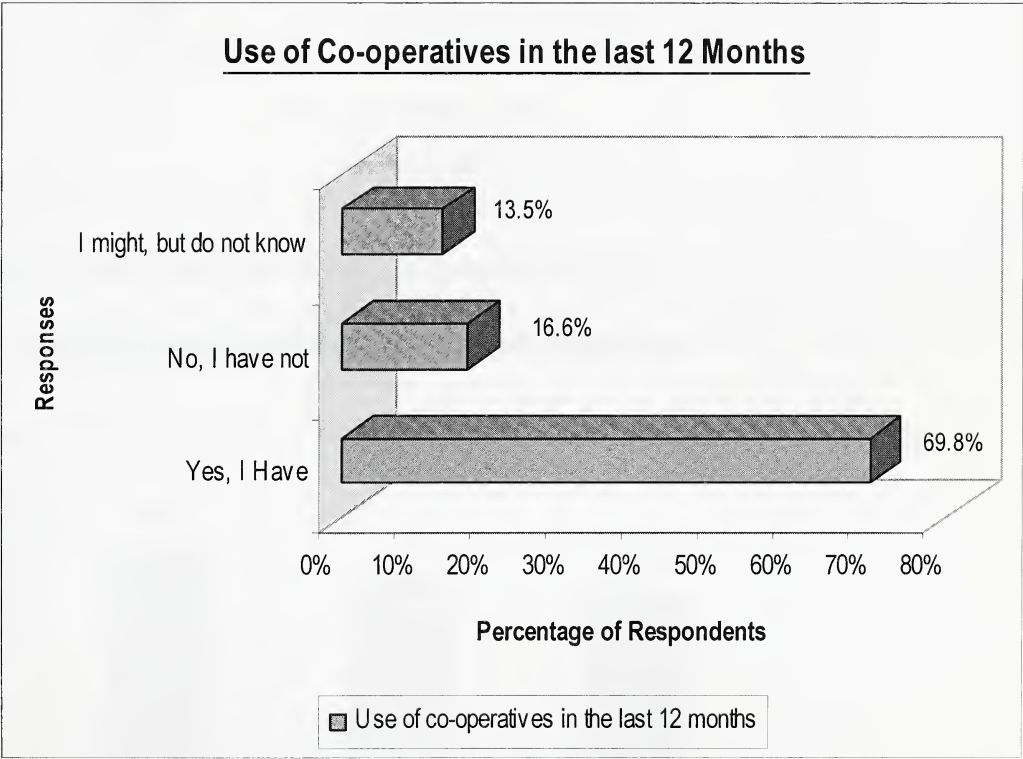


Over half of the respondents indicated that they would be likely to consider patronizing co-operatives. One third expressed that they are extremely likely to consider patronage

and less than eleven percent are slightly likely. Only three percent are not sure of their consideration to patronize co-operatives.

The percentage of respondents who are extremely unlikely, unlikely, and slightly likely, to patronize co-operatives accounts for less than two percent of the respondents. This led to the combination of the response in these categories (about 1 percent) with the not sure data category, for the purpose of our analysis. Although most of the respondents indicated that they were likely to patronize co-operatives, however, the degree of likeliness varies, and this is the basis of our further analysis.

Figure 5.2-3: Patronage of Co-operatives in the Past 12 Months



Almost 70 percent of the respondents indicated that they have purchased products and services from co-operatives in the last twelve months. About 13 percent are not sure and 17 percent might have not but do not know.

Figure 5.2-4: Membership Status of Respondents Familiar with the Concept of Co-ops

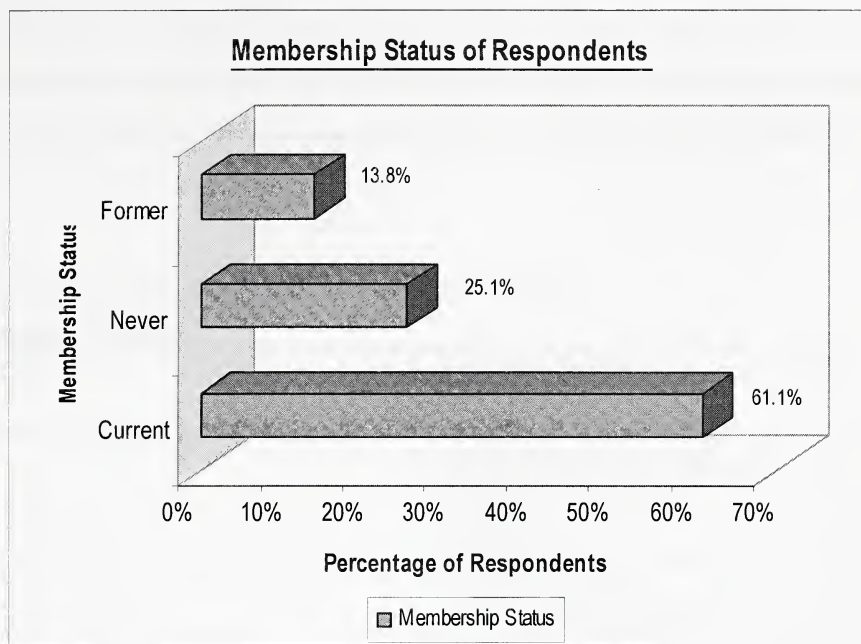
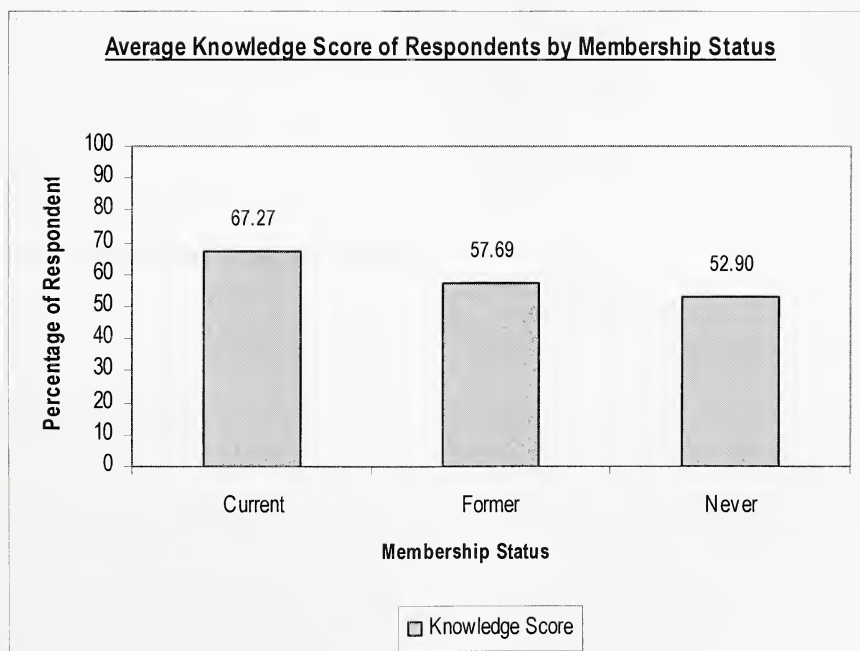


Figure 5.2-5: Mean Knowledge Score of Respondents by Membership Status



Membership Status in Co-operatives

As shown in figure 5.2-4, 61 percent of the respondents were current co-operative members. This is more than double the percentage of never been members, and former members are almost a quarter of the percentage of current members.

Table 5.2-2: Distribution of Data of Dependent Variables

<u>Dependent Variables</u>				
<i>Variables</i>	<i>#</i>	<i>Response Choices</i>	<i>N</i>	<i>%</i>
Intention to purchase from co-operatives	1	More inclined not to purchase	1	0.6%
	2	Slightly inclined not to purchase	0	0%
	3	Inclined not to purchase	1	0.5%
	4	indifferent	59	38.0%
	5	Slightly inclined to purchase	34	20.0%
	6	Inclined to purchase	50	29.2%
	7	More inclined to purchase	25	11.6%
		Total	170	100%
Consideration to patronize co-operatives	1	Extremely unlikely	2	0.4%
	2	Unlikely	3	0.8%
	3	Slightly unlikely	0	0%
	4	Not Sure	5	3.4%
	5	Slightly unlikely	18	10.6%
	6	Likely	82	51.6%
	7	Extremely Likely	61	33.3%
		Total	171	100%
Use of co-operatives in the last 12 months	1	Yes, I Have	111	69.8%
	2	No, I have not	32	16.6%
	3	I might, but do not know	22	13.5%
		Total	165	100%
Membership status	1	Current	101	61.1%
	2	Never	45	25.1%
	3	Former	24	13.8%
		Total	170	100%

5.2.3. Cross Tabulations

The relationship between the responses indicated by respondents and each of the variables are examined and discussed in this subsection as presented in the crosstabs in the tables shown in Appendices 6-15. Appendix 15 shows the cross tabulation of membership status versus the independent variables and dependent variables.

Starting with the age variable, most of the current members are over 55 years old, and most of the former members are in the 45-54 years old age category. The percentage of never been members is highest in the 35-44 years old and the 45-54 years old categories respectively.

The current members have the highest income bracket of between \$150,000-199, 000 and over \$250,000 per annum before tax. There are no former or never been members of co-operatives in these two income categories. Current members group also has the highest percentage of low income earners, earning less than \$49,000 per annum. None of the never been members or former members of co-operatives earn more than \$149,000 per annum before tax. The majority of the respondents earned below \$99,000 before tax, in all the membership groups. On average, former members are in the \$50,000-\$99,000 income bracket. The never been members of co-operatives mostly earned less than \$49,000 per annum before tax.

The population of current male members of co-operatives are three times as much as the never been members, and over four times as the former male members. However, for females, 50 percent of them are current members, 38 percent have never been members, and 13 percent are former members of co-operatives.

In terms of education, about 50 percent of the former members have at least a university degree , compared to about 43 percent of never been members, and 38 percent of current members.

There are more rural dwellers within the former members of co-operatives group. Only 12 percent of them are urban dwellers. Whereas, 32 percent of current members and 27 percent of never been members of co-operatives are rural dwellers.

For the knowledge score, current members are more knowledgeable about co-operatives principles than former members. Further, former members score higher than the never been members. However, the difference in knowledge score between these two latter categories is less than three percent.

The table containing the reports results also shows that most of the respondents who indicated that they were extremely likely to consider to patronize co-operatives (if co-operatives offered good prices, good services, and quality products, contributed to the community, and offered good price discounts to members) are current members. The result presented in Appendix 15 is consistent with the structure of membership. For the current members, the majority (97%) of them indicated that they have purchased services and products of a co-operative in the past 12 months. Only two current members indicated that they have not, and only one current member of a co-operative indicated that they might have but did not know. In comparison, 50 percent of the former members have not used co-operatives in the last 12 months, 25 percent indicated that they have or might have and did not know. For the never been members, 41 percent have not used co-operatives, 27 percent have and 32 percent might have but do not know. We can conclude that most current members have patronized co-operatives in the last twelve months.

5.2.4. Recoding of the Variables

Some the variables had to be recoded because the number of respondents that chose some of the choice categories were nil or extremely low. The tables with the recoded variables are presented in appendix 1 and 2. With respect to the Age variable for instance, none of the respondents was twenty years old and younger, therefore that category had to be deleted from the final analysis. In the case of education, most of the respondents had at least some high school education; this made the first two categories of no school at all and grade school inapplicable, and they were also not included. Income is well

represented in all the categories, hence the initial coding was not revised. Location was left the same with the binary code of 0 or 1. The details are available in the appendix.

The recoding of some of the dependent variables was mentioned in section 5.2.2 above while describing the data, and the tables in the appendix illustrate this further. The first two dependent variables shown in Appendices 4 and 5 were recoded due to low choice numbers in three categories of the seven choices provided. These first two dependent variables are the intention to purchase from co-operatives and consideration to patronize co-operatives respectively. The percentages of respondents in these categories are less than three percent. Consequently, both variables were recoded into four (0, 1, 2, & 3) categories respectively, instead of the initial seven by adding all the observation in the first three categories to the fourth category.

5.3 Selection of the Models

Following the theoretical framework discussed in chapter 4, ordered probit and multinomial logit model analyses are carried out using LIMDEP statistical software package version 3.0 (Greene, 1995). The significance level for this analysis was 90% ($\alpha = 0.9$). Results are then interpreted by using the omitted level as the point of comparison for the other levels. Four dependent variables were each analyzed individually with four models.

5.3.1. Model Estimation Procedure

Before deciding the model that best describes the estimated variables, different restrictions are tested to decide the final specification of each model. A series of regressions were carried out using the same socio-economic and demographic variables, knowledge score and belief variables as the independent variables in the basic model but restricting some or one variable at a time in other models. Likelihood ratio tests $\lambda_{LR} = 2[ln(L)_u - ln(L)_r]$ ²¹ were conducted to estimate the importance of the inclusion of

²¹ LR = Log Likelihood Ratio Test.

Where, r = restricted (the maximum value of the likelihood function for the model subject to restriction(s)), and u = unrestricted (the maximum value of the likelihood function for the model without restriction(s)), also the base model.

the respective variables in the final models. Under the null hypothesis, the test statistic is asymptotically distributed as chi-square with degrees of freedom equal to the number of restrictions to be tested (Green, 2003). The calculated chi-square statistics were compared at the 0.05 critical level on the chi-square distribution table for the corresponding degrees of freedom.

First, the base models were analyzed for each of the dependent variables. All the independent variables were included in the base models. The results of each of these models are presented as Model 1 in each case. In the next set of models, referred to as Model 2, three of the belief variables were excluded from the base models, at a time. This is to examine the effect of using fewer variables for the analyses, and also to rule out the possible effect of multicollinearity. It should be noted that each of the independent variables was also excluded one at a time for this purpose as well. Not all the results of these analyses are presented as there were no further significant effects detected in the improvement of results, or evidence of reduction of multicollinearity in these models. For the third set of models, referred to as Model 3, only the significant variables in the Model 1 set are used in the estimation. The results are presented in the tables 5.4-1 to 5.4-4 below. The model with the highest log likelihood ratio is selected for the final specification, which in each case is the Model 1 set.

Therefore, in the process of model estimation, we reject the null hypotheses that the excluded variable(s) are significant with the implication that they do not contribute to the explanatory power of the model in explaining the dependent variable. These null hypotheses were individually and jointly rejected at 0.05 significance level. Hence, the regressions will be carried out with the inclusion of all the specified variables in the ordered probit models. This is the same in the multinomial logit models using all independent variables, but excluding membership status. The exclusion of this independent variable was to prevent the problem of multi-collinearity in the case of the third dependent variable (Use of Co-operatives in the Last 12 Months) and the fourth dependent variable (Membership Status).

5.4 Models Specification and Selection

The indirect utility function (V_m) for a respondent n of a choice is specified as follows. Model 1 for each of the dependent variables is analyzed as presented below.

Ordered Probit Models

Model *INTENT1: Intention to Patronize Co-operatives*

$$\begin{aligned} \text{Intention to patronize Co-operatives} = & \beta_{0i} + \beta_{1i}\text{Age} + \beta_{2i}\text{Gender} \\ & + \beta_{3i}\text{Education} + \beta_{4i}\text{Income} + \beta_{5i}\text{Residence} + \beta_{6i}\text{KnowledgeScore} \\ & + \beta_{7i}\text{BeliefFactor1} + \beta_{8i}\text{BeliefFactor2} + \beta_{9i}\text{BeliefFactor3} \\ & + \beta_{10i}\text{BeliefFactor4} + \beta_{11i}\text{BeliefFactor5} + \beta_{12i}\text{BeliefFactor6} \\ & + \beta_{13i}\text{MembershipStatus} + \varepsilon_m \end{aligned} \quad 5.4-1$$

Model *PTRONCI: Consideration to Patronize Co-operatives*

$$\begin{aligned} \text{Consideration to patronize Co-operatives} = & \beta_{0i} + \beta_{1i}\text{Age} + \beta_{2i}\text{Gender} \\ & + \beta_{3i}\text{Education} + \beta_{4i}\text{Income} + \beta_{5i}\text{Residence} + \beta_{6i}\text{KnowledgeScore} \\ & + \beta_{7i}\text{BeliefFactor1} + \beta_{8i}\text{BeliefFactor2} + \beta_{9i}\text{BeliefFactor3} \\ & + \beta_{10i}\text{BeliefFactor4} + \beta_{11i}\text{BeliefFactor5} + \beta_{12i}\text{BeliefFactor6} \\ & + \beta_{13i}\text{MembershipStatus} + \varepsilon_m \end{aligned} \quad 5.4-2$$

Multinomial Logit Models

Model *USECOOP1: Patronage of Co-operatives in the last 12 Months*

$$\begin{aligned} \text{Patronage of Co-operatives in the last 12 months} = & \beta_{0i} + \beta_{1i}\text{Age} + \beta_{2i}\text{Gender} \\ & + \beta_{3i}\text{Education} + \beta_{4i}\text{Income} + \beta_{5i}\text{Residence} + \beta_{6i}\text{KnowledgeScore} \\ & + \beta_{7i}\text{BeliefFactor1} + \beta_{8i}\text{BeliefFactor2} + \beta_{9i}\text{BeliefFactor3} \\ & + \beta_{10i}\text{BeliefFactor4} + \beta_{11i}\text{BeliefFactor5} + \beta_{12i}\text{BeliefFactor6} + \varepsilon_m \end{aligned} \quad 5.4-3$$

Model *MEM1: Membership Status in Co-operatives*

$$\begin{aligned} \text{Membership Status in Co-operatives} = & \beta_{0i} + \beta_{1i}\text{Age} + \beta_{2i}\text{Gender} \\ & + \beta_{3i}\text{Education} + \beta_{4i}\text{Income} + \beta_{5i}\text{Residence} + \beta_{6i}\text{KnowledgeScore} \\ & + \beta_{7i}\text{BeliefFactor1} + \beta_{8i}\text{BeliefFactor2} + \beta_{9i}\text{BeliefFactor3} \\ & + \beta_{10i}\text{BeliefFactor4} + \beta_{11i}\text{BeliefFactor5} + \beta_{12i}\text{BeliefFactor6} + \varepsilon_m \end{aligned} \quad 5.4-4$$

For the second group of estimated models, Model 2s, some of the belief variables (belief factors 4-6) were omitted.

Ordered Probit Models

Model **INTENT2** & Model **PTRONC2**

$$\begin{aligned}
 V_{in} = & \beta_{0i} + \beta_{1i}Age + \beta_{2i}Gender + \beta_{3i}Education + \beta_{4i}Income + \beta_{5i}Residence \\
 & + \beta_{6i}KnowledgeScore + \beta_{7i}BeliefFactor1 + \beta_{8i}BeliefFactor2 \\
 & + \beta_{9i}BeliefFactor3 + \beta_{10i}MembershipStatus + \varepsilon_{in}
 \end{aligned}
 \tag{5.4-5}$$

Multinomial Logit Models

Model **USECOOP2** & Model **MEM2**

$$\begin{aligned}
 V_{in} = & \beta_{0i} + \beta_{1i}Age + \beta_{2i}Gender + \beta_{3i}Education + \beta_{4i}Income + \beta_{5i}Residence \\
 & + \beta_{6i}KnowledgeScore + \beta_{7i}BeliefFactor1 + \beta_{8i}BeliefFactor2 \\
 & + \beta_{9i}BeliefFactor3 + \varepsilon_{in}
 \end{aligned}
 \tag{5.4-6}$$

In this equations, β_i represent coefficients vectors of the explanatory variables for each of the i choice of response ($i = 1, \dots, 4$) for the ordered probit models (and ($i = 1, \dots, 3$) for the multinomial logit models). The results of these estimated coefficient and t-statistics (giving the choice probabilities at means) for each of the models tested are presented in Tables 5.4-1 to 5.4-4 and others are presented in the Appendix. The reduced versions of the models were consequently assessed to rule out the effect of collinearity with no significant difference in the results. The results are presented in the column 2 of the tables below as *Model INTENT2*, *Model PTRONC2*, *Model USECOOP2*, and *Model MEM2*. These models were analyzed again for sensitivity or robustness of the estimates. In order to test for robustness of the model and the possible effects of multicollinearity, a third set of models was estimated, eliminating the non-significant independent variables found in the first set of models.

Model INTENT3 (Intention towards co-operative product/services)

$$V_{in} = \beta_{0i} + \beta_{1i} \text{Residence} + \beta_{2i} \text{KnowledgeScore} + \beta_{3i} \text{BeliefFactor1} + \beta_{4i} \text{BeliefFactor2} + \varepsilon_{in} \quad 5.4-7$$

Model PTRONC3 (Consideration to patronize co-operative)

$$V_{in} = \beta_{0i} + \beta_{1i} \text{BeliefFactor1} + \beta_{2i} \text{BeliefFactor2} + \beta_{3i} \text{BeliefFactor3} + \beta_{4i} \text{BeliefFactor6} + \varepsilon_{in} \quad 5.4-8$$

Model USECOOP3: (Patronage of co-operative in the last 12 months)

$$V_{in} = \beta_{0i} + \beta_{1i} \text{Age} + \beta_{2i} \text{KnowledgeScore} + \beta_{3i} \text{BeliefFactor2} + \beta_{4i} \text{BeliefFactor3} + \beta_{5i} \text{BeliefFactor4} + \beta_{6i} \text{BeliefFactor6} + \varepsilon_{in} \quad 5.4-9$$

Model MEM3 (Membership status in co-operative)

$$V_{in} = \beta_{0i} + \beta_{1i} \text{Age} + \beta_{2i} \text{Income} + \beta_{3i} \text{Residence} + \beta_{4i} \text{BeliefFactor1} + \beta_{5i} \text{BeliefFactor2} + \beta_{6i} \text{BeliefFactor3} + \beta_{7i} \text{BeliefFactor4} + \varepsilon_{in} \quad 5.4-10$$

The results of these four models are presented in column 3 of the respective tables as *Model INTENT3*, *Model PTRONC3*, *Model USECOOP3*, and *Model MEM3*. These models are the reduced versions of the Model 1s reported in the first columns of the tables, and they include as indicated previously, only the variables found to be significant as shown in equations 5.4-7 to 10 above.

The results for each of the four dependent variables are presented in the following tables.

Table 5.4-1: Intention Towards Product/Services Provided by Co-operatives

VARIABLES	Model INTENT1		Model INTENT2		Model INTENT3	
	Coeff.	t-ratio	Coeff.	t-ratio	Coeff.	t-ratio
Constant	-1.473	-1.826	-1.601	-2.018	-0.878	-1.995
Age	0.008	0.699	0.010	0.886		
Gender	0.283	1.296	0.269	1.244		
Income	0.003	1.205	0.004	1.411	0.004c	1.669
Education	0.061	0.380	0.033	0.211		
Membership Status	0.052	0.372	0.057	0.410		
Knowledge Score	0.008c	1.735	0.008c	1.946	0.009b	2.134
Location	0.393c	1.768	0.414c	1.894	0.381c	1.846
FAC1_2	-0.284a	-2.650	-0.283a	-2.655	-0.242b	-2.424
FAC2_2	0.605a	5.610	0.598a	5.564	0.566a	5.509
FAC3_2	-0.001	-0.012	0.002	0.019		
FAC4_2	-0.021	-0.214				
FAC5_2	0.050	0.502				
FAC6_2	0.096	0.972				
Mu(1)	0.675	6.872	0.674	6.888	0.659	6.866
Mu(2)	1.929	12.049	1.919	12.084	1.887	12.048
Correct predictions	51.02% (75)		49.66% (73)		49.66% (73)	
Log likelihood function	-167.022		-167.6347		-169.1938	
Restricted log likelihood	-195.085		-195.0849		-195.0849	
LR Test Chi Sq ²²	56.13 (13)		54.90 (10)		51.78 (5)	
Prob[ChiSq d > value]	0.0000		0.0000		0.0000	
R-square (%) ²³	14.38%		14.07%		13.27%	

Note: a denotes significance at 1 percent level; b at 5 percent; c at 10 percent

Knowledge Score, Location, FAC1_2, FAC2_2 are significant in the three *INTENT1*, *2* and *3* models. However, income is also significant in the Model *INTENT3*.

Model INTENT1 was selected for the analysis of the data because it has the highest correct predictions; it also has the highest log likelihood ratio (LR Test Chi Sq) and, the highest pseudo-R square. After extensive test of other models, which includes the removal of each independent variable, one at time, no other model was found to be better than model 1. This led to the choice of this model for analysis and further discussion. The results are presented and discussed in the next chapter.

²² Log Likelihood Ratio = -2[Log-L Unrestricted model - Log-L Restricted model]

²³ R-square (%)=Pseudo R2 = 1-[LnL(b) / LnL(No coefficients)]

Table 5.4-2: Consideration to Patronize Co-operatives

<i>Variables</i>	Model PTRONC1		Model PTRONC2		Model PTRONC3	
	<i>Coeff.</i>	<i>t-ratio</i>	<i>Coeff.</i>	<i>t-ratio</i>	<i>Coeff.</i>	<i>t-ratio</i>
<i>Constant</i>	2.299	2.721	1.907	2.325	2.027	13.443
<i>Age</i>	-0.017	-1.458	-0.012	-1.079		
<i>Gender</i>	0.024	0.106	0.011	0.048		
<i>Income</i>	0.003	1.159	0.005c	1.710		
<i>Education</i>	0.179	1.060	0.112	0.682		
<i>Membership Status</i>	-0.184	-1.288	-0.177	-1.266		
<i>Knowledge Score</i>	-0.003	-0.653	-0.001	-0.331		
<i>Location</i>	0.214	0.902	0.246	1.064		
<i>FAC1_2</i>	-0.274a	-2.461	-0.282a	-2.561	-0.291b	-2.854
<i>FAC2_2</i>	0.391a	3.633	0.375a	3.515	0.396a	4.024
<i>FAC3_2</i>	-0.251b	-2.324	-0.214b	-2.027	-0.253a	-2.615
<i>FAC4_2</i>	0.147	1.422				
<i>FAC5_2</i>	-0.151	-1.386				
<i>FAC6_2</i>	0.216b	2.057			0.172c	1.798
<i>Mu(1)</i>	0.796	5.406	0.771	5.493	0.733	5.414
<i>Mu(2)</i>	2.672	14.447	2.561	14.792	2.489	14.810
Correct predictions	61.90% (91)		61.90% (91)		63.27% (93)	
Log likelihood function	-130.357		-134.205		-136.4769	
Restricted log likelihood	-152.264		-152.2644		-152.2644	
LR Test Chi Sq	43.82 (13)		36.12 (10)		31.57 (4)	
Prob[ChiSq > value]	0.0000		0.0001		0.0000	
R-square (%)	14.39%		11.86%		10.37%	

Note: a denotes significance at 1 percent level; b at 5 percent; c at 10 percent

FAC1_2, FAC2_2, FAC3_2, FAC6_2 are the only variables significant of the three *PTRONC1*, *PTRONC 2* and *PTRONC 3* models.

Model PTRONC1 was selected for the analysis of the data for similar reasons discussed under the previous “INTENT” model. However, although model *PTRONC3* has higher percentage of correct predictions than the other two models, other indicators such as the log likelihood ratio (LR Test Chi Sq) and the Psuedo R-square are not as good as model 1. Hence, the choice of model 1 for further discussion. The results are presented and discussed in the next chapter.

Table 5.4-3: Patronage of Co-operatives in the Past 12 Months

Variables	Model USECOOP 1			Model USECOOP 2			Model USECOOP 3		
	No N=29	Might N=19	Yes N=99	No N=29	Might N=19	Yes N=99	No N=29	Might N=19	Yes N=99
Choice Probabilities	0.129	0.09	0.782	0.166	0.085	0.749	0.161	0.101	0.737
Constant	0.004 (0.002)	2.598 (1.134)		0.232 (0.118)	2.610 (1.145)		-0.843 (-0.639)	0.931 (0.683)	
Age	-0.001 (-0.025)	-0.052c (-1.660)		-0.005 (-0.196)	-0.053c (-1.706)		0.007 (0.279)	-0.054c (-1.885)	
Gender	0.636 (1.045)	-0.255 (-0.406)		0.402 (0.692)	-0.292 (-0.478)				
Income	0.002 (0.227)	-0.018 (-1.537)		-0.001 (-0.194)	-0.019 (-1.584)				
Education	-0.020 (-0.047)	0.315 (0.617)		0.113 (0.282)	0.283 (0.562)				
Knowledge Score	-0.019c (-1.771)	-0.007 (-0.572)		-0.017c (-1.658)	-0.007 (-0.542)		-0.015 (-1.501)	-0.005 (-0.461)	
Location	-0.844 (-1.367)	-0.752 (-1.022)		-0.642 (-1.056)	-0.664 (-0.927)				
FAC1_2	0.217 (0.780)	0.346 (1.128)		0.156 (0.591)	0.376 (1.248)				
FAC2_2	-0.676b (-2.295)	-1.023a (-3.158)		-0.529b (-1.971)	-1.033a (-3.249)		-0.593 (-2.219)	-0.948a (-3.142)	
FAC3_2	1.249a (3.868)	0.746b (2.170)		0.981a (3.545)	0.719b (2.160)		0.965a (3.699)	0.743b (2.431)	
FAC4_2	0.562c (1.801)	0.055 (0.179)							
FAC5_2	0.440 (1.495)	0.107 (0.326)							
FAC6_2	-0.489c (-1.817)	0.032 (0.095)					-0.444c (-1.799)	-0.087 (-0.274)	
Correct predictions	73.47% (108)			70.07% (103)			69.39% (102)		
LL function	-97.07			-101.61			-103.99		
Restricted LL	-125.081			-125.081			-125.081		
LR Test Chi Sq	56.02 (24)			46.94 (18)			42.16(10)		
Prob[ChiSq > value]	0.0002			0.0002			0.0000		
R-square (%)	22.39%			18.76%			16.85%		

Note: a denotes significance at 1 percent level; b at 5 percent; c at 10 percent

In the ‘No’ response categories, FAC2_2, FAC3_2, are statistically significant in the 3 models Knowledge Score is significant in USECOOP1 and USECOOP2 but not in USECOOP3. FAC4_2 is statistically significant in Model USECOOP1, it is restricted in USECOOP2, and not significant in USECOOP3. FAC6_2, is significant in the ‘no’ response categories of both USECOOP1 and USECOOP3 models. In the ‘might’

response category, Age, FAC2_2, FAC3_2, are the three variables statistically significant in all the three models. Model USECOOP1 was selected for similar reasons expressed under the INTENT model. The analysis of the data and the results are presented and discussed in the next chapter.

Table 5.4-4: Membership Status in Co-operatives

Variables	Model MEM1			Model MEM2			Model MEM3		
	Never N=38	Former N=23	Current N=86	Never N=38	Former N=23	Current N=86	Never N=38	Former N=23	Current N=86
Choice Probabilities	0.222	0.125	0.653	0.231	0.136	0.633	0.224	0.137	0.640
Constant	2.966 (1.623)	2.831 (1.302)		2.901 (1.642)	2.413 (1.129)		3.688 (2.658)	2.372 (1.397)	
Age	-0.052b (-2.045)	-0.036 (-1.136)		-0.053b (-2.179)	-0.029 (-0.959)		-0.065a (-2.746)	-0.036 (-1.241)	
Gender	-0.183 (-0.364)	0.072 (0.113)		-0.258 (-0.531)	-0.073 (-0.119)				
Income	-0.015c (-1.700)	-0.008 (-1.044)		-0.014c (-1.689)	-0.007 (-0.945)		-0.015c (-1.779)	-0.007 (-0.981)	
Education	0.305 (0.776)	0.151 (0.327)		0.343 (0.900)	0.083 (0.187)				
Knowledge Score	-0.009 (-0.928)	-0.011 (-1.025)		-0.010 (-0.983)	-0.010 (-0.866)				
Location	-0.370 (-0.687)	-1.405c (-1.829)		-0.261 (-0.502)	-1.170 (-1.577)		-0.446 (-0.867)	-1.254c (-1.717)	
FAC1_2	0.470c (1.833)	0.781a (2.692)		0.441c (1.765)	0.767a (2.672)		0.518c (2.061)	0.767a (2.705)	
FAC2_2	-0.627b (-2.473)	-0.724b (-2.484)		-0.569b (-2.325)	-0.698b (-2.526)		-0.651b (-2.687)	-0.764a (-2.811)	
FAC3_2	0.753a (2.891)	0.466 (1.538)		0.683a (2.784)	0.421 (1.441)		0.706a (3.001)	0.454 (1.573)	
FAC4_2	0.438c (1.684)	0.242 (0.800)					0.430c (1.680)	0.234 (0.804)	
FAC5_2	-0.048 (-0.195)	0.485 (1.480)							
FAC6_2	-0.203 (-0.849)	0.140 (0.460)							
Correct predictions	68.03% (100)			63.95% (94)			63.27% (93)		
Log likelihood function	-113.943			-117.6975			-117.337		
Restricted log likelihood	-140.17			-140.1751			-140.175		
LR Test Chi Sq	52.46 (24)			44.96 (18)			45.68 (14)		
Prob[ChiSq > value]	0.0007			0.0004			0.0000		
R-square (%)	18.71%			16.04%			16.29%		

Note: a denotes significance at 1 percent level; b at 5 percent; c at 10 percent

For the never category, Age, Income, FAC1_2, FAC2_2, and FAC3_2 are statistically significant in the three *MEM* models. FAC4_2 is significant in *MEM1* and *MEM3*, and omitted in *MEM2*. FAC1_2 and FAC2_2 are the only two variables significant in the all *MEM1*, *MEM2*, and *MEM3* models for the former co-operatives members. Model *MEM1* was selected for the analysis of the data. The results are presented and discussed in the next chapter.

Model MEM1 and USECOOP1 were selected for the analysis of the data for similar reasons already discussed under the ‘INTENT’ model. However, membership status was not included in the USECOOP models to prevent co-dependence among two or more independent variables which could lead to multicollinearity. There is every possibility that more co-operatives current members might have patronized co-operatives in the last 12 months.

5.5 Summary

In this Chapter, models were estimated to explain the discrete choices the survey respondents made. Several models were tested for robustness and to eliminate multicollinearity. One set (Model 1 in each case) was selected for further analysis and detailed discussion of results in the next chapter.

6.0 Discussion of Results

The models were estimated using the econometrics software LIMDEP Version 3.0 (Green 2003). The first two ordered probit models are discussed first, followed by the two multinomial logit models (MNL). In each of the models estimated, the results of the regression are discussed focusing on the statistical significance of the explanatory variables. Following this, are brief discussions of the predicted outcomes, touching on the effectiveness of the models. Finally, the marginal effects of the explanatory variables on the dependent variable are discussed for each of the four models. The results from the log-likelihood ratio test indicate that the selected estimated models were statistically valid. The values of the pseudo R-squared also indicate acceptable goodness of fit.

The objective of this study is to investigate the factors that are responsible for the patronage, membership and commitment in co-operatives. Understanding these can assist in providing additional insights into some demographic, socio-economic, belief and perception factors that might influence people's membership and patronage decisions. It is envisaged that the results could contribute to the management tools of managers and the board of co-operatives, for the formulation of policies towards improvement in membership commitment and patronage.

Not many variables were included in the model in order to adjust for the sample size because increasing that number would have used up more degrees of freedom and could have affected the overall significance of the models. Therefore, factor analysis was used in reducing the number of belief variables from seventeen to six. Further, knowledge score a singled aggregated variable was derived as discussed earlier in Chapter 3.

The Ordered Probit Models

The ordered nature of the responses to the first two questions necessitates the use of an ordered probit model for initial half of the analysis. Dosman, Adamowicz and Hurdey (2001) noted that when analyzing ordered probit results, three issues need to be considered. First, the marginal effects of the regressors indicate the impact of changes in

the regression; that is, they indicate the change in probability of being in a particular category in response to a change in the independent variable. Second, these marginal effects are not equal to, but are computed from, the estimated coefficients. Third, a change in one of the variables will shift the distribution. The direction of the shift for choices $\text{Prob}(y=0)$ and $\text{Prob}(y=2)$, can be determined from the parameter sign, that is, if β is positive the $\text{Prob}(y=0)$ will decline. However, it is not clear whether $\text{Prob}(y=1)$ would increase or decrease. The ambiguous changes depend on how the density function shifts.

In the ordered probit models, postulated intention towards co-operative product/services and, the consideration to purchase good/services from co-operatives are respectively assumed to be dependent on a set of individual-specific (respondent-specific) variables. The results for each of the dependent variables are considered and discussed separately as follows.

6.1 Intention to Purchase Product from Co-operatives

6.1.1. Discussion of Results

Table 6.2-1 below (also seen in Table 5.4-1) shows the results of the regression of the first ordered probit model that examined the intention of respondents towards products/services provided by co-operatives. The results show that knowledge score and location variables were statistically significant at 5 percent. Belief factor 1 (FAC2_1) and factor 2 (FAC2_2) were highly statistically significant at 1 percent. Belief factor 1 is related to the belief that co-operatives should be in business solely for financial reasons. Belief factor 2, on the other hand, highlights the economic and social responsibility roles of co-operatives. The results also show that Belief factor 1 is negatively associated to intention to patronize co-operatives, while Belief factor 2 is positively associated with it. This implies that for people who believe co-operatives should worry more about profits than about social issues, their intention towards co-operative goods and services are not likely to be positive. The remaining three statistically significant coefficients are positively related to the intention to purchase co-operative goods and services. The interpretation of this is that people who possess a high knowledge score about co-operative principles, dwell in urban areas, and believe that co-operatives should be

economically, environmentally and socially responsible to the community, have positive intentions towards the purchase of products/services from co-operatives. It also demonstrates that knowledge about the concepts and principles of co-operatives plays a significant role in co-operatives patronage.

Surprisingly, none of the socio-economic demographic variables is statistically significant. Age, gender, education status, income or membership status in co-operatives were not statistically significant. This implies that none of these variables play an important role in affecting respondents' intentions towards goods and services provided by co-operatives. From the analysis, it seems that beliefs about the altruistic principles of co-operatives, coupled with views regarding the economic versatility in the business, the level of knowledge about co-operatives principles and also the location of the respondents are the factors responsible for intention to patronize co-operatives. These are the variables that would affect the attitudes of people towards purchasing products from co-operatives. In terms of location, urban dwellers are likely to have more ready access to co-operative establishments than the rural dwellers. This might have influenced the result; however, further analysis would be needed to clarify this aspect.

The coefficients threshold levels μ_1 and μ_2) were both positive and properly ordered. They were positive and highly statistically significant at 0.1 percent, which confirms that there is an ordering in the attitudes of the respondents. Highly significant, positive threshold estimate indicates that the categories in the response variable are indeed ordered. These threshold variables are interpreted as the numerical linkages between the utility function of respondents and the preference ratings for their choices.

According to Maddala (1983), the threshold coefficients μ_{ij} should exhibit the relationship $\mu_{1j} \leq \mu_{2j} \leq \mu_{3j} \leq \mu_{j-1,i}$, and must be positive. The failure to exhibit these conditions would imply specification error of the model. The results imply that there is no misspecification error in the foregoing ordered probit model.

The benefit of the predicted outcomes matrix is in identifying the percentage of correct guesses versus naive predictions by the probit model. The model is statistically

significant as indicated by the chi-square statistic in Table 6.1-1 above. The overall significance level of the model is observed to be (0.0000) which is highly significant. The goodness of fit of estimation is further evident in the model's ability to predict the respondent's actual choice correctly 51.02 percent of the time. The expected predictability of a random 4-option model is 25 percent. And this result is well above the double of that level. Even though the model was significant, it did not capture all of the complexity in the issues. The log likelihood function which is used to test the significance of the model has a value of -167.022.

Table 6.1-1: Intention Towards Product/Services Provided by Co-operatives – Results

Variable	Coeff.	Std.Err.	T-Ratio	P-Value
Constant	-1.473*	0.807	-1.826	0.068
Age	0.008	0.011	0.699	0.484
Gender	0.283	0.218	1.296	0.195
Income	0.003	0.003	1.205	0.228
Education	0.061	0.161	0.380	0.704
Membership Status	0.052	0.141	0.372	0.710
Knowledge Score	0.008*	0.004	1.735	0.083
Location	0.393*	0.222	1.768	0.077
FAC1_2	-0.284***	0.107	-2.650	0.008
FAC2_2	0.605***	0.108	5.610	0.000
FAC3_2	-0.001	0.102	-0.012	0.990
FAC4_2	-0.021	0.097	-0.214	0.830
FAC5_2	0.050	0.100	0.502	0.616
FAC6_2	0.096	0.099	0.972	0.331
Mu(1)	0.675***	0.098	6.872	0.000
Mu(2)	1.929***	0.160	12.049	0.000

***denotes significance at 1 percent level; **at 5 percent; *at 10 percent

Dependent variable	INTENT (Intention to Product X)
Log likelihood function	-167.022
Restricted log likelihood	-195.085
Log likelihood ratio tests	56.125 (D.F.=13)
Prob[ChiSq > value]	0.0000
% predicted correctly	51.02%
*R-square (%)	14.38%

*Log Likelihood Ratio = -2[Log-L unrestricted model - Log-L restricted model]

**R-square (%)=Pseudo R2 = 1-[LnL(b) / LnL(No coefficients)]

6.1.2. Predicted Outcomes

Table 6.1-2 below shows the predicted versus actual outcomes of the model. The model performs the best in its prediction of the actual value for “Inclined” and “Indifferent” responses respectively, predicting 74 versus 47 actual for “Inclined” and predicting 64 versus 50 actual for “Indifferent” responses. Otherwise, it grossly underestimates the “Slightly inclined” and not so well for “More inclined” option values (predicted 0 versus 30 for “Slightly inclined”, 9 versus 20 for “More inclined”) and overestimates responses with higher values. The model predicts that 43.5 percent of respondents will be indifferent and 50.3 percent will be inclined, both higher when compared to the actual 34 percent and 32 percent.

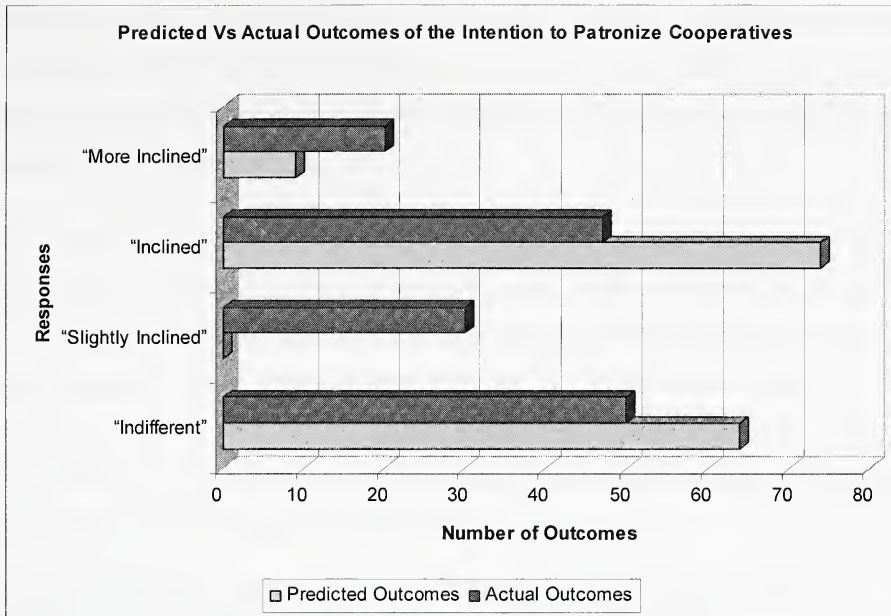
Table 6.1-2: Intention Towards Co-operatives – Predicted Versus Actual Outcomes.

Actual	Predicted				Actual Row Sum	
	“Indifferent”	“Slightly Inclined”	“Inclined”	“More Inclined”		
“Indifferent”	37	0	13	0	50	34.0%
“Slightly Inclined”	14	0	16	0	30	20.4%
“Inclined”	10	0	33	4	47	31.9%
“More Inclined”	3	0	12	5	20	13.6%
<i>Predicted</i>	64	0	74	9	147	
<i>Col Sum</i>	43.5%	0.0%	50.3%	6.1%		100%

Note: Prediction is number of the most probable cell. Row is actual, column is predicted

This table is also depicted in the Figure 6.1-1 as shown.

Figure 6.1-1: Intention Towards Co-operatives– Predicted Versus Actual Outcomes.



6.1.3. Marginal Effects

Marginal effects assist in understanding further how the dependent variable (intentions towards the co-operatives product/services) is related to the independent variables. These effects are evaluated by assuming that a given respondent has the mean score for every independent variable, in other words, that the respondent is average in every way. The technique enables the isolation of the effect of a change in one variable on intention towards the purchase of co-operative goods, while all the other variables remain constant.

Some respondents are more inclined to purchase from co-operatives than the others. From Table 6.1-3, it can be seen that respondents who are motivated by the pure financial profitability of co-operatives as the underlying intention towards the purchase of goods and services provided by co-operatives (FAC1_2), are nearly 10 percent more likely to choose the indifferent option, about 1.5 percent more likely to choose “Slightly Indifferent”, 7 percent less likely to choose “Inclined” and 4.3 percent less likely to choose “More inclined”. Whereas, the respondents who believe in the main principles and objectives of co-operatives as being both economically and socially responsible are

about 20.8 percent less likely to indicate that they are “Indifferent” towards their intention towards co-operatives product/services. They are 3.1 percent less likely to be “Slightly Inclined” of their intentions, 14.7 percent more likely to be “Inclined” and about 9.2 percent more likely to “More Inclined” in their intention toward the goods and services of co-operatives.

For knowledge score, although the coefficients underlying marginal effects are very small, their statistical significance means that this variable has an effect on the intention to purchase product/services from co-operatives. For respondents who are slightly more knowledgeable about co-operatives, they are 0.3 percent less likely to choose the indifferent option, 0.04 percent less likely to choose slightly inclined, and 0.2 percent more likely to be inclined and 0.12 percent more likely to choose more inclined to purchase co-operatives goods and services.

Table 6.1-3: Intention Towards Co-operatives Product/Services - Marginal Effects

<i>Variable</i>	<i>Indifferent</i>	<i>Slightly Inclined</i>	<i>Inclined</i>	<i>More Inclined</i>
<i>Constant</i>	0.000	0.000	0.000	0.000
Age	-0.003	0.000	0.002	0.001
Gender	-0.100	-0.011	0.070	0.040
Income	-0.001	0.000	0.001	0.001
Education	-0.021	-0.003	0.015	0.009
Membership Status	-0.018	-0.003	0.013	0.008
Knowledge Score	-0.003	0.000	0.002	0.001
Location	-0.135	-0.020	0.095	0.060
FAC1_2	0.098	0.015	-0.069	-0.043
FAC2_2	-0.208	-0.031	0.147	0.092
FAC3_2	0.000	0.000	0.000	0.000
FAC4_2	0.007	0.001	-0.005	-0.003
FAC5_2	-0.017	-0.003	0.012	0.008
FAC6_2	-0.033	-0.005	0.023	0.015

Note - Marginal effects averaged over individuals

From the results, location or the dwelling of respondents also has significant effect on the respondent’s intention towards goods and services of co-operatives. Urban dwellers are 13.5 percent less likely to be indifferent, 2 percent less likely to slightly inclined, 9.5 percent more likely to be inclined and 6 percent more likely to be more inclined towards co-operative goods and services.

6.2 Consideration to Patronize Co-operative Products/Services

6.2.1. Discussion of Results

In terms of consideration to patronize co-operatives, beliefs also play major roles in respondents' decisions. Four belief variables out of six were statistically significant at 5 percent level or higher (See the summarized and restated results in table 6.2-1 alternatively, column 3 in Table 5). The remaining two were not highly statistically insignificant either. Surprising though, knowledge score is not significant and neither are all the socio-economic variables. Marrying the results of the earlier probit analysis (6.1.1) above, the positive social and environment contributions of co-operatives, and their altruistic and profitability attributes (FAC2_2), are positively related to patronage. FAC2_1 is negatively related to patronage decision, this is the belief that co-operatives should be in business for pure financial reasons, thereby favoring IOFs business over co-operatives. Both were statistically significant at 5 and 1 percent respectively. Up to this point these results are similar to those of the intention to patronize co-operatives in 6.1.1 above.

FAC3_2 is statistically significant at 5 percent and it is negatively related to patronage. It is the belief factor relating to awareness about co-operatives, including the beliefs that large co-operatives are less sustainable as co-operatives in the long run, in that they would eventually turn to IOFs. Respondents who believe this factor are less likely to consider co-operative patronage even when it provides goods/services they usually use. Furthermore, FAC6_2 is statistically significant and positively related to patronage of co-operatives. The interpretation of this is the people who believe that the co-operative is a group of people doing business, which the basic definition of co-operatives, are likely to patronize co-operatives.

The socioeconomic and demographic variables were not statistically significant at 10 percent. This can be interpreted that they do not have significant effect on the decision of the respondents to patronize co-operatives. Location of the residence of respondents does not seem to play a significant role and the same applies for membership status in co-operatives.

The coefficients threshold levels $\mu(1)$ and $\mu(2)$ were both positive and properly ordered as shown in table 6.2-1. They were positive and statistically significant at 0.1 percent. They also validate the use of the ordered probit model.

Discussion on Intent to Purchase Vs Consideration to Patronize Co-operatives

At first glance, the questions that formed the basis of the ‘Intention’ and ‘Consideration’ models as presented above, seem to be similar. However, they do vary to some degree and the results obtained from the analyses of the models are different. The first question asked respondents about their intention to purchase from co-operatives (If it was said that product/service X (one that you buy) is provided by a co-operative organization, how would it affect your intentions towards the product?). Whereas, the next question asked the respondents about their consideration to purchase from co-operatives, with emphasis on co-operatives concepts/principles, and without compromise for quality of the products (Would you consider patronizing co-operative if you knew that co-operative offer good prices, good services, and quality products, contributes to the community, and offers good price discount for members?).

The consideration question, which is the second question, seems broader and has more depth than the first one, the intention question. The results also showed that intention to purchase is influenced by respondents’ knowledge about co-operatives concepts, location of their residence, negative emphasis on financial beliefs about co-operatives, FAC2_1, and positive beliefs about their socio-economic and altruistic attributes, FAC2_2. In contrast, belief factors were found to be solely responsible for the consideration to patronize co-operatives. Apart from belief factors FAC2_1 and FAC2_2 discussed earlier, two other belief factors FAC3_2 and FAC6_2 were also found to be statistically significant in respondents’ consideration to patronize co-operatives. This includes respondents’ awareness about the concept and principles of co-operatives, and also an understanding of the basic definition of co-operatives.

Conclusions can be drawn from the results that the respondents’ beliefs about co-operatives appear to be the major explanation responsible for the consideration to

patronize co-operatives. For the intention to purchase from co-operatives, beliefs about co-operatives are partly responsible. Other factors such as location and knowledgeable ability are also part of the reasons why respondents intend to purchase co-operatives products/services.

The log likelihood function which is used to test the significance of the model has a value of -130.36. The overall significance level of the model is observed to be (0.0000) which is highly significant.

Table 6.2-1: Consideration to Patronize Co-operatives – Results

Variable	Coeff.	Std.Err.	T-Ratio	P-Value
Constant	2.299	0.845	2.721	0.007
Age	-0.017	0.012	-1.458	0.145
Gender	0.024	0.227	0.106	0.916
Income	0.003	0.003	1.159	0.246
Education	0.179	0.169	1.060	0.289
Membership Status	-0.184	0.143	-1.288	0.198
Knowledge Score	-0.003	0.004	-0.653	0.514
Location	0.214	0.237	0.902	0.367
FAC1_2	-0.274**	0.111	-2.461	0.014
FAC2_2	0.391***	0.108	3.633	0.000
FAC3_2	-0.251**	0.108	-2.324	0.020
FAC4_2	0.147	0.104	1.422	0.155
FAC5_2	-0.151	0.109	-1.386	0.166
FAC6_2	0.216**	0.105	2.057	0.040
Mu(1)	0.796***	0.147	5.406	0.000
Mu(2)	2.672***	0.185	14.447	0.000

***denotes significance at 1 percent level; **at 5 percent; *at 10 percent

Dependent variable	PATRONC (Consideration to patronize)
Log likelihood function	-130.36
Restricted log likelihood	-152.26
Log likelihood ratio tests	43.816 (D.F.=13)
Prob[ChiSq d > value]	0.0000
% Predicted Correctly	61.90%
R-square (%)	14.39%

Log Likelihood Ratio = -2[Log-L unrestricted model - Log-L restricted model]

R-square (%)=Pseudo R2 = 1-[LnL(b) / LnL(No coefficients)]

6.2.2. Predicted Outcomes

As shown in the table 6.2-2, model correctly predicts about 61.9 percent of the responses analyzed, although this is not very high, it is acceptable. The model performs the best in its prediction of the actual value for “Likely” response, predicting 103 versus 77 actual and not bad for “Extremely likely” predicting 43 versus 52 actual. “Slightly likely” was grossly underestimated and it did not do so well for “Indifferent” option values (predicted 0 versus 13 for “Slightly likely”, 1 versus 5 for “Not sure”) and again it overestimates responses with higher values.

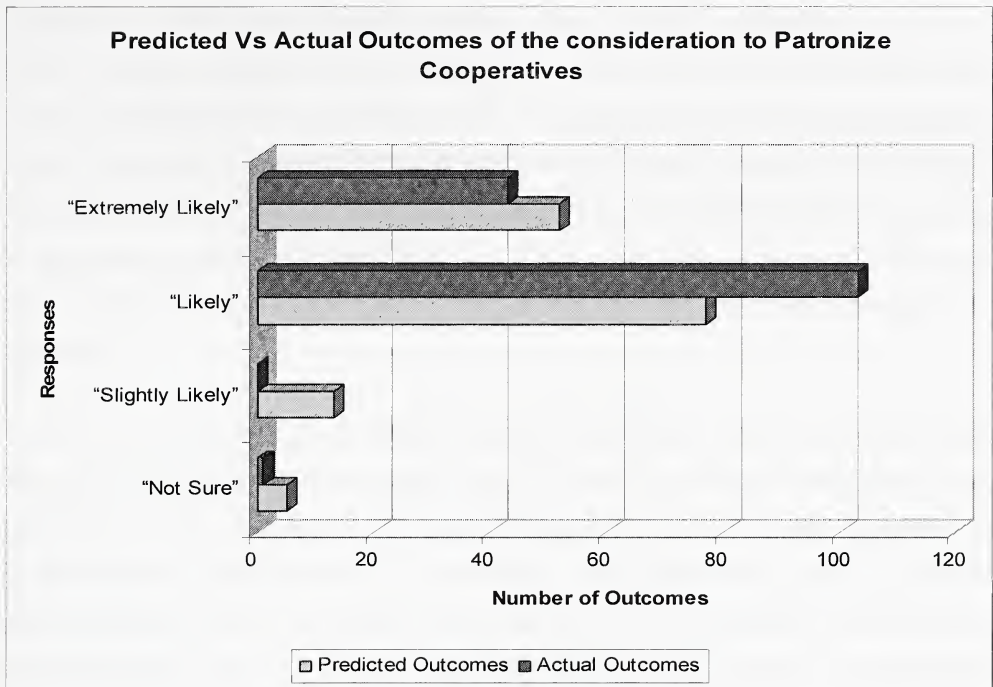
Table 6.2-2: Consideration to Patronize Co-op – Predicted Versus Actual Outcomes.

Actual	Predicted				Actual Row Sum	
	“Not Sure”	“Slightly Likely”	“Likely”	“Extremely Likely”		
“Not Sure”	0	0	5	0	5	3.4%
“Slightly Likely”	0	0	12	1	13	8.8%
“Likely”	0	0	63	14	77	52.4%
“Absolutely Likely”	1	0	23	28	52	35.4%
<i>Predicted</i>	1	0	103	43	147	
<i>Col Sum</i>	0.7%	0.0%	70.1%	29.3%		100%

Note: Prediction is number of the most probable cell. Row is actual, column is predicted

Figure 6.2-1 below illustrates the predicted versus actual outcomes.

Figure 6.2-1: Consideration to Patronize Co-op – Predicted versus Actual Outcomes



6.2.3. Marginal Effects

From Table 5.1.2-3, it can be seen that the respondents who believe that co-operatives are profitable, involved in the community, and pay more attention to the environmental issues (FAC2_2), are about 1.3 percent less likely to choose the 'not sure' option when considering to patronize co-operatives. They are also 4.3 percent less likely to choose 'slightly likely', 5.9 percent more likely, and 14.1 percent to choose 'likely' 'extremely likely' to more likely patronize co-operatives. The marginal effect increases as we move towards the extremely likely option. For respondents who believe purely in financial roles for co-operatives, they are about 1 percent likely 'not sure' of their patronage decision, 3 percent slightly likely, about 6 percent more likely to choose 'likely', and nearly 10 percent less likely to indicate that they will be 'extremely likely' to patronize co-operatives. For FAC3_2, relates to respondents who were not aware of co-operatives or not familiar with co-operative/Credit Unions, and who believe that large co-operatives are less sustainable as co-operatives, they would eventually turn to IOFs. They are 1

percent more likely to choose the not sure option, about 3 percent more likely to indicate that they are ‘slightly likely’, about 5 percent to likely patronize, and about 9 percent less likely to choose ‘extremely likely’ to patronize co-operatives even when offered good prices, and quality products, contributes to the community and offers price discounts. For factor 6, respondents who believe the co-operative is a group of people doing business, are about 8 percent more inclined to indicate that they are ‘extremely likely’ to patronize co-operatives and about 1 percent to be less likely to say they are not sure. This same group is about 5 percent less likely to indicate that they are will ‘likely’ patronize co-operatives.

Even when the prices are good, services are great and discounts are offered, respondents that believe that IOFs are more versatile than co-operatives, and that management of co-operatives are less sustainable, and would eventually turn to IOFs are less likely to indicate that they would patronize co-operatives. On the other hand, people who believe that co-operatives can be advantageous and profitable, are involved in the community and environmentally conscious, and those who understand the basic concept of co-operatives are more likely to choose the ‘extremely likely’ option to patronize co-operatives.

Table 6.2-3: Consideration to Patronize Co-op – Marginal Effects

<i>Variable</i>	Not Sure	Slightly Likely	Likely	Extremely Likely
<i>Constant</i>	0.000	0.000	0.000	0.000
Age	0.001	0.002	0.004	-0.006
Gender	-0.001	-0.003	-0.005	0.009
Income	0.000	0.000	-0.001	0.001
Education	-0.006	-0.020	-0.039	0.065
Membership Status	0.006	0.020	0.040	-0.066
Knowledge Score	0.000	0.000	0.001	-0.001
Location	-0.007	-0.024	-0.046	0.077
FAC1_2	0.009	0.030	0.059	-0.099
FAC2_2	-0.013	-0.043	-0.084	0.141
FAC3_2	0.009	0.028	0.054	-0.090
FAC4_2	-0.005	-0.016	-0.032	0.053
FAC5_2	0.005	0.017	0.032	-0.054
FAC6_2	-0.007	-0.024	-0.046	0.078

Note - Marginal effects averaged over individuals

The Multinomial Logit Models

Multinomial logit models also known as polytomous²⁴ logistic regressions, use maximum-likelihood estimation for polytomous dependents. Multinomial logit models handles non-independence by estimating the models for all outcomes simultaneously except, as in the use of dummy variables in regression, one category is ‘left out’ to serve as a baseline. Since effects must sum to zero, the model for the reference group can be reproduced from other parameters in the output.

The two multinomial logit models postulate that patronage of co-operatives in the last 12 months and membership status in co-operatives, respectively, are assumed to be dependent on a set of individual-specific (respondent-specific) variables such as socio-economic and demographic, belief and knowledge variables. A reference choice category is assumed in the log odds ratio form for the estimation of the models. The options ‘Yes I have’ in the patronage of co-operatives in the last 12 months and ‘Current Members’ in membership status served as the baseline and normalized to zero. They are both assumed as the reference choices respectively. The estimated coefficients β_j for all $j(j = 1, \dots, J)$ after normalizing these above stated alternatives to zero ($j = 0$) measure the effect of the explanatory variables in the indirect utility function on likelihood of choosing i relative to these options j which are normalized.

The results of the two multinomial logit models are presented below. The first model discussed is about the usage and purchase of service or products from co-operatives in the last 12 months. The question used as the dependent variable solicits the respondents’ to patronage of co-operatives in the last 12 months. The second multinomial logit model is relates to respondents’ membership status in co-operatives. Both models each have three choices of responses.

²⁴ Subdivided into many distinct subordinate parts.

6.3 Patronage of Co-operative Service/Products in the Past 12 Months

6.3.1. Discussion of Result

The results of the multinomial logit model used to determine the effect of socio-economic and demographic, and other variables on patronage of co-operatives in the last 12 months are shown below. The three choice of responses were ‘yes’, ‘no’, and ‘might’ coded 0, 1, and 2 respectively. It should be noted that these responses are not ordered. The yes response is the reference choice category assumed because it is the main response of interest. The estimated coefficients α_j for all $j(j=1, \dots, J)$, after normalizing the ‘Yes’ alternative $j=0$, measure the effect of the explanatory variables in the indirect utility function on the likelihood of patronizing co-operative in the last 12 months relative to the ‘Yes’ option j . The responses are not ordered, hence the use of the multinomial logit model.

The regression results showed that none of the socio-economic and demographic variables are statistically significant at 10 percent in the “No” response category. However, four of the six belief factors, Belief factors 2, 3, 4 and 6, were statistically significant at 10 percent. Knowledge score was also statistically significant at 10 percent. These results can be interpreted that respondents’ behavior of not patronizing a co-operative in the last twelve months is influenced by their knowledge of co-operatives and their beliefs about co-operatives.

The value of the log likelihood function used to test the significance of the model is - 97.07. The overall significance level of the model is highly significant (0.0002).

Factor 2_2 has a negative coefficient with patronage of co-operative in the last twelve months, and is associated with altruistic, social responsibility, economic and environmental roles of co-operatives. This implies that people who do not believe in these roles for co-operatives are more likely to belong to the no group. Factor 2_3 has a positive coefficient, this is the belief variable associated with awareness about co-

operatives and the objectives of co-operatives. This implication of this is that people who are aware of co-operatives objectives are negatively associated to the no group.

Table 6.3-1: Patronage of Co-operative in the Past 12 Months – Results

Characteristics in numerator of Prob[Y = 1] No

Variable	Coefficient	Std. Error	T-Ratio	P-Value
Constant	0.004	2.079	0.002	0.998
Age	-0.001	0.029	-0.025	0.980
Gender	0.636	0.609	1.045	0.296
Income	0.002	0.008	0.227	0.820
Education	-0.020	0.426	-0.047	0.962
Knowledge Score	-0.019*	0.011	-1.771	0.077
Location	-0.844	0.617	-1.367	0.172
FAC1_2	0.217	0.279	0.780	0.435
FAC2_2	-0.676**	0.295	-2.295	0.022
FAC3_2	1.249***	0.323	3.868	0.000
FAC4_2	0.562*	0.312	1.801	0.072
FAC5_2	0.440	0.294	1.495	0.135
FAC6_2	-0.489*	0.269	-1.817	0.069

Characteristics in numerator of Prob[Y = 2] Might

Constant	2.598	2.290	1.134	0.257
Age	-0.052*	0.031	-1.660	0.097
Gender	-0.255	0.627	-0.406	0.685
Income	-0.018	0.012	-1.537	0.124
Education	0.315	0.510	0.617	0.537
Knowledge Score	-0.007	0.013	-0.572	0.567
Location	-0.752	0.735	-1.022	0.307
FAC1_2	0.346	0.307	1.128	0.259
FAC2_2	-1.023***	0.324	-3.158	0.002
FAC3_2	0.746**	0.344	2.170	0.030
FAC4_2	0.055	0.305	0.179	0.858
FAC5_2	0.107	0.327	0.326	0.744
FAC6_2	0.032	0.341	0.095	0.924

***denotes significance at 1 percent level; **at 5 percent; *at 10 percent

Dependent variable	RCCOOPUS
Log likelihood function	-97.07
Restricted log likelihood	-125.081
Log likelihood ratio tests	56.022 (D.F.=24)
Prob[ChiSq > value]	0.0002
% Predicted Correctly	73.47% (108)
R-square (%)	22.39%

Log Likelihood Ratio = -2[Log-L unrestricted model - Log-L restricted model]

R-square (%)=Pseudo R² = 1-[LnL(b) / LnL(No coefficients)]

Factor 2_4 is the belief that credit unions are similar to banks and it also has a positive coefficient, and respondents who believe this statement are more connected to no group. Factor 2_6 represents respondents understanding of basic definition of co-operative with a negative coefficient. The respondents who do not understand the basic definition of co-operatives are associated with the ‘no’ response group.

On the contrary in the “Might have but do not know” category, age is statistically significant at 10 percent. Knowledge score was not statistically significant, but factor 2_2 and 2_3 were significant. The behavior of a respondent who might have patronized a co-operative in the last twelve months but do not know is influenced by the respondent’s age, their belief about the socio-economic roles of co-operative, and the awareness about the co-operative overall purpose and objectives. The explanation above for the ‘no’ response group applies for the ‘might’ group because the signs on the coefficients are the same. However age is negatively related to the ‘might’ category. The implication of this is the younger respondents are more associated to the ‘might have used co-operatives in the last 12 months and not know group’.

6.3.2. Predicted Outcomes

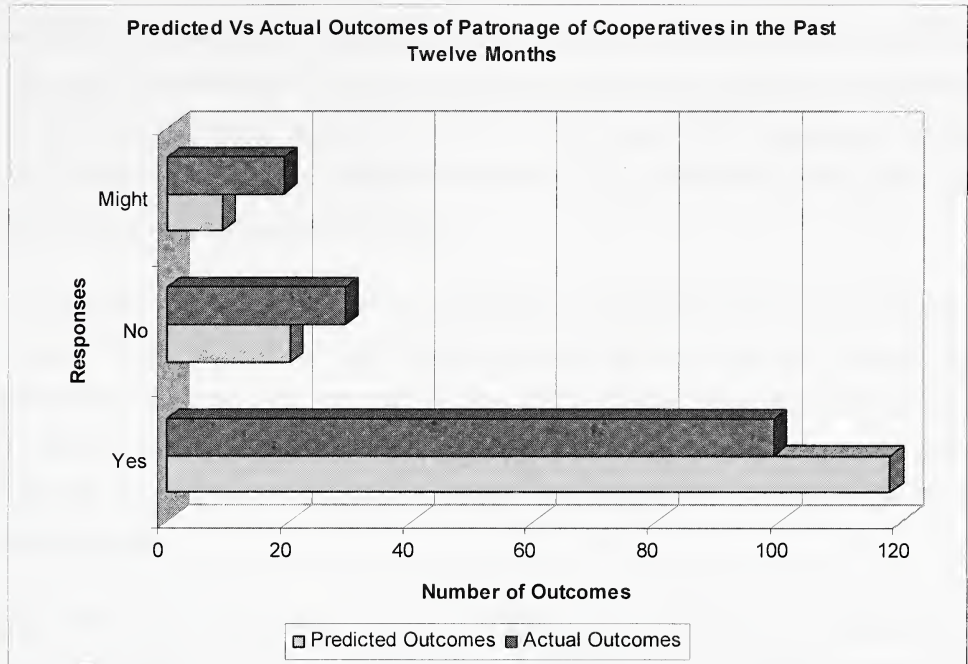
The model predictability high for this model, in comparison with to the probit models discussed earlier. It correctly predicts about 73.47 percent of the responses analyzed. The model performs the best in its prediction of the values for ‘yes’ and ‘no’ responses. The model predicted 118 versus 99 actual for yes and 20 predictions out of 29 for no responses. It performed not too well in the prediction of the ‘might but do not know’ response category with almost 50 percent correct prediction, predicting 9 out of 19 actual.

Table 6.3-2: Patronage of Co-operative in the Past 12 Months – Predicted Actual & Outcomes.

Actual	Predicted			Actual Row Sum	
	Yes	No	Might		
Yes	90	5	4	99	67.3%
No	16	13	0	29	19.7%
Might	12	2	5	19	12.9%
Predicted	118	20	9	147	
Col Sum	80.3%	13.6%	6.1%	100%	100%

Note: Predicted outcome has maximum probability. Row is actual, column is predicted

Figure 6.3-1: Patronage of Co-operative in the Past 12 Months –Predicted Versus Actual Outcomes.



6.3.3. Marginal Effects

The table of marginal effects averaged on individuals presented below expresses the probability of change in patronage of co-operatives in the last twelve months with respect to each independent variable measured from the mean of that variable.

In both no and might categories, factors 2 and 3 were statistically significant as seen previously in Table 6.3-1, and both have the same signs on their coefficients. Factor 2_2 is the belief associated with social responsibility, economic and environmental roles of co-operative, and it has a negative coefficient with patronizing co-operative in the last twelve months. Factor 2_3 is the belief variable associated with awareness about co-operative objectives and it has a positive coefficient. Reference to Table 6.3-3, respondents who believe that co-operative should be socially, environmentally, as well as economically responsible (FAC2_2), are 13.1 percent more likely to answer yes, 5.4 percent less likely to answer no and about 8 percent less likely indicate that they might

but do not know. This can be interpreted that consciousness of co-operatives patronage in the last 12 months by respondents was likely influenced by their belief about roles of co-operatives. For people who might have used co-operatives but do not know, probably if they believe in the altruistic roles of co-operatives, they would consciously patronized co-operatives in the last 12 months or could have been sure of their patronage. The 'no' group probably consciously avoided co-operatives to have been so assertive about their patronage of coops in the last 12 months.

Respondents who are not aware of co-operatives, not familiar with how co-operatives operate, or who do not know the differences between large co-operatives and large IOFs and believe that they will eventually become publicly traded firms (FAC3_2), are about 17 percent less likely to chose yes, 13 percent more likely to chose no, and 3 percent more likely to choose might but do not know on patronage of co-operatives in the last twelve months.

For factor 4, the respondents who feel that credit union and banks are similar are 5.7 percent less likely to have not patronized co-operatives in the past twelve months, and about 6.9 percent more likely to have not and 1.2 percent less likely to might have and do not know.

For the respondents who do not know that a co-operative is a group of people doing business, are 6.2 percent less likely to have patronized co-operative in the last twelve months. The respondents who are aware of this about co-operatives are 4 percent more likely to have patronized co-operatives in the last 12 months, and for those who might have but do not know, they are 1.8 percent more likely to have patronized co-operatives in the last 12 months.

The age of the respondents has a negative effect on those who might have used co-operative in the last twelve months and do not know. The younger respondents are 4 percent more likely to say yes to patronage of co-operatives in the last 12 months, 2 percent more likely to indicate no and 5 percent less likely to have patronized co-operatives in the last 12 months and do not know. Although this result seems ambiguous,

this can be interpreted that the 5 percent who are not sure of their patronage is the highest in the 3 categories. Since they are not sure, they might still be persuadable. Further studies might be able to show the effect of this more clearly.

Table 6.3-3: Patronage of Co-operative in the Past 12 Months – Marginal Effects

Variable	Yes	No	Might but do not know
<i>Constant</i>	-0.169	-0.079	0.248
Age	0.004	0.002	-0.005
Gender	-0.044	0.088	-0.044
Income	0.001	0.001	-0.002
Education	-0.019	-0.012	0.031
Knowledge Score	0.002	-0.002	0.000
Location	0.129	-0.083	-0.046
FAC1_2	-0.043	0.017	0.026
FAC2_2	0.131	-0.054	-0.077
FAC3_2	-0.167	0.134	0.033
FAC4_2	-0.057	0.069	-0.012
FAC5_2	-0.049	0.052	-0.003
FAC6_2	0.044	-0.062	0.018

Note - Marginal effects averaged over individuals

6.4 Membership Status

6.4.1. Discussion of Results

A reference choice category is assumed, in this case it is the current membership status category because that is the main category of interest. The estimated coefficients α_j for all $j(j=1, \dots, J)$, after normalizing the 'Current' alternative $j=0$, measure the effect of the explanatory variables in the indirect utility function on the likelihood of membership status in co-operatives relative to the 'Current' option j .

Two of the socio-economic and demographic variables, age and income, were statistically significant in the never been members group at 5 and 10 percent respectively, and they both have negative coefficients. This can be interpreted that age and income plays significant roles with respect to never been members of co-operatives. The age result is consistent with the findings of Fulton and Adamowicz (1993). Belief Factors 1 and 4 were statistically significant at 10 percent, factor 2 (FAC2_2), at 5 percent, and factor 3 (FAC3_2), at 1 percent for the 'Never been members' group. Only factor 2 has negative coefficient, the remaining statistically significant belief variables (2, 3, and 4) coefficients are positive.

In the former members of co-operatives category, location is the only socio-economic and demographic variable which is statistically significant at 10 percent. This shows that former members of co-operatives are not from a certain age group, do not belong to a certain income group, do not have a particular level of education and do not belong to a specific gender group. However, they are more associated with rural dwelling. The results imply that the reason for being a former member goes beyond socio-economic and demographics. There are likely many reasons to leave a co-operative, but socio-economic and demographic factors do not seem to be a critical part of them. Factors 1 and 2 were also statistically significant for this former members group. Factor 1 has a positive coefficient and factor 2 has a negative coefficient. The interpretations of this follow the earlier discussions.

The negative signs on the estimated coefficients of age and income, imply that the never been members are associated with the younger respondents, and people in the lower income category. Statistically significant Factor 2_2 with a negative coefficient for this group can be seen as an indication that the respondent in this group are the ones who do not believe in the social responsibility, economic and environmental roles of co-operatives. They do not believe that the co-operative is profitable and advantageous in terms of doing business. On the contrary, factor 1 that has a positive coefficient, can be interpreted to mean that respondents who believe that IOFs are better, more efficient, and more versatile than the co-operative are more associated with being never been members of co-operatives.

In the former members group, the explanation provided above for the never been members group also applies to this group. This can be interpreted that the former members are those that believe that co-operatives should operate purely like a commercial entity (IOFs) and not as the socially conscious organization that it is meant to be.

It is however a surprise that knowledge score was not statistically significant in both cases. Factor 3, the factor related to the degree of awareness about co-operatives, has a positive coefficient in the never been members group. Implying that never been members who are aware of co-operatives are more likely to become current members.

The chi-square statistic of 0.0007 of this multinomial logit model as showed in the table above is an indication that the model is statistically significant. The goodness of fit of estimation is further evident in the model's ability to predict the respondent's actual choice correctly 68.03 percent of the time, which quite reasonable.

Table 6.4-1: Membership Status in Co-operatives – Results

Characteristics in numerator of Prob[Y = 1] Never been Members				
<i>Variable</i>	<i>Coefficient</i>	<i>Std. Error</i>	<i>T-Ratio</i>	<i>P-Value</i>
Constant	2.966	1.828	1.623	0.105
Age	-0.052***	0.025	-2.045	0.041
Gender	-0.183	0.503	-0.364	0.716
Income	-0.015*	0.009	-1.700	0.089
Education	0.305	0.392	0.776	0.438
Knowledge Score	-0.009	0.010	-0.928	0.353
Location	-0.370	0.538	-0.687	0.492
FAC1_2	0.470*	0.256	1.833	0.067
FAC2_2	-0.627**	0.253	-2.473	0.013
FAC3_2	0.753***	0.260	2.891	0.004
FAC4_2	0.438*	0.260	1.684	0.092
FAC5_2	-0.048	0.246	-0.195	0.845
FAC6_2	-0.203	0.239	-0.849	0.396
Characteristics in numerator of Prob[Y = 2] Former Members				
Constant	2.831	2.174	1.302	0.193
Age	-0.036	0.032	-1.136	0.256
Gender	0.072	0.639	0.113	0.910
Income	-0.008	0.008	-1.044	0.297
Education	0.151	0.463	0.327	0.744
Knowledge Score	-0.011	0.011	-1.025	0.305
Location	-1.405*	0.768	-1.829	0.067
FAC1_2	0.781***	0.290	2.692	0.007
FAC2_2	-0.724**	0.291	-2.484	0.013
FAC3_2	0.466	0.303	1.538	0.124
FAC4_2	0.242	0.303	0.800	0.424
FAC5_2	0.485	0.327	1.480	0.139
FAC6_2	0.140	0.304	0.460	0.645

***denotes significance at 1 percent level; **at 5 percent; *at 10 percent

Dependent variable	MBSTATUS
Log likelihood function	-113.943
Restricted log likelihood	-140.175
Log likelihood ratio tests	52.46 (D.F.=24)
Prob[ChiSq > value]	0.0007
% predicted correctly	68.03 % (100)
R-square (%)	18.71%

Log Likelihood Ratio = -2[Log-L unrestricted model - Log-L restricted model]
R-square (%)=Pseudo R2 = 1-[LnL(b) / LnL(No coefficients)]

6.4.2. Predicted Outcomes

The model has a correct predictability percentage of 68.03 percent, which is quite reasonable. The model performs best with its prediction of the current members, predicting 103 instead of 86, and worst with former members, predicting 15 instead of 23. And for ‘never been members’, predicted 29 instead of 38. The log likelihood function used to test the significance of the model has a value of -113.943.

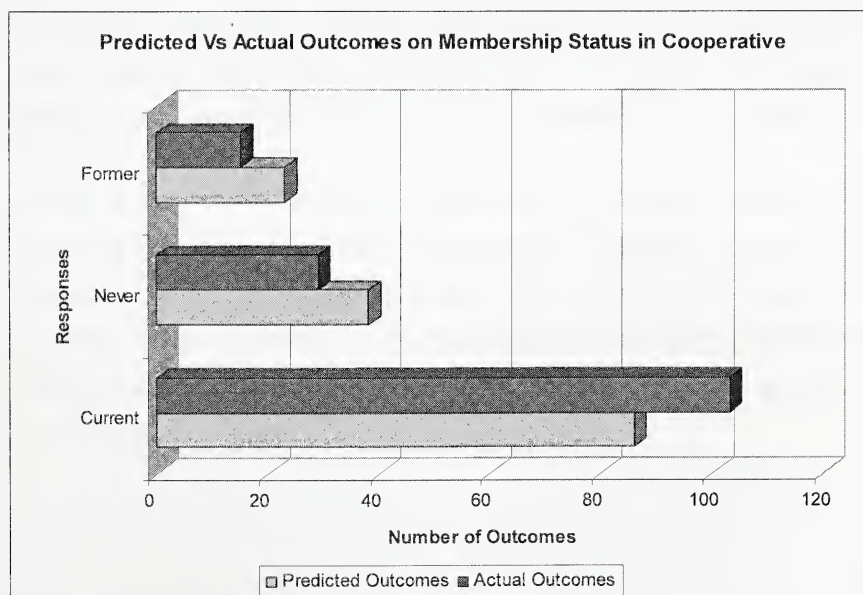
Table 6.4-2: Membership Status in Co-operatives – Predicted Versus Actual Outcomes.

Actual	Predicted			Actual Row Sum I	
	Current	Never	Former		
Current	75	9	2	86	58.5%
Never	18	16	4	38	25.9%
Former	10	4	9	23	15.6%
<i>Predicted</i>	103	29	15	147	100%
<i>Col Sum</i>	70.1%	19.7%	10.2%		

Note: Predicted outcome has maximum probability. Row is actual, column is predicted

The plot of the above table is shown in the figure 6.4-1

Figure 6.4-1: Membership Status in Co-operatives – Predicted Versus Actual Outcomes.



6.4.3. Marginal Effects

The results for marginal effect analysis for non-members of co-operatives are presented as follows. For factor 2 (FAC2_2), respondents who believe that co-operatives have other economic and social responsibilities than merely commercial, are about 6.6 percent less likely to be 'Never been members' of co-operatives, 5.5 percent less likely to be former members and 12 percent likely to be current members. This may indicate that the 'never been members' group are made aware of this belief they might be easier to recruit into co-operative membership. In the case of factor 1(FAC1_2), respondents who believe that IOFs are more versatile than co-operative are 10.8 percent less likely to be members of co-operatives, for the former members 7 percent more likely not be a current member, and in the never been member group, about 4 percent more likely not be a current member.

Former members who believe that co-operatives are less versatile than IOFs and that large are less sustainable, and would eventually turn to IOFs (FAC3_2), are 11.7 percent less likely to be current members, 9.7 percent more likely to be never been members, and 2 percent more likely to belong to the former members group.

The younger never been members of co-operatives are 0.7 percent less likely to be current members. The effect of income is almost the same, low income never been members are 0.2 percent less likely to be current members of co-operative.

In terms of location, rural dwellers are less likely to be current members of co-operative. This is might be due to the distance of the nearest co-operative store and also rural based co-operative stores are increasingly being taken over by IOF chains (IGAs, Sobeys, Presidents Choice and others)²⁵. The disappearance of the older 'neighborhood store' co-operative model stores, might be a reason for the low current co-operative membership among the rural dwellers.

²⁵ Goddard, E. 2003, Lecture notes

Table 6.4-3: Membership Status in Co-operatives –Marginal Effects

Variable	Current	Never	Former
<i>Constant</i>	-0.531	0.337	0.194
Age	0.008	-0.007	-0.002
Gender	0.015	-0.032	0.017
Income	0.002	-0.002	0.000
Education	-0.045	0.041	0.004
Knowledge Score	0.002	-0.001	-0.001
Location	0.140	0.005	-0.145
FAC1_2	-0.108	0.039	0.069
FAC2_2	0.121	-0.066	-0.055
FAC3_2	-0.117	0.097	0.020
FAC4_2	-0.066	0.058	0.008
FAC5_2	-0.029	-0.029	0.058
FAC6_2	0.013	-0.038	0.025

Note - Marginal effects averaged over individuals

7.0 Summary and Conclusions

7.1 Summary of Background, Problem and Findings

This study examined the factors that affect peoples' behavior towards co-operatives. The goal of this study was to identify the key socio-economic and demographic characteristics, and other behavioral factors, of members and non members of co-operative. This will assist in understanding the factors that are responsible for increasing co-operative patronage and member commitment. The results of the study provide suggestions on how to improve patronage and membership commitment among co-operative members and in the recruitment of non members alike. The results are also useful for formulating strategies on membership recruitment and retention by co-operative management.

The information utilized for the analysis was collected through a mail survey in Alberta, Canada. Potential respondents were randomly selected through a stratified sampling method, and sent questionnaires via prepaid postage. Respondents included current co-operative members, former members and never been members of co-operatives. Although the response rate was low (16.9 percent), it compared well with most other mail-in studies. The questionnaires were structured to obtain respondents' familiarity with co-operative and their attitudes, beliefs and perceptions of co-operatives. Factor analysis, mean score, multinomial logit analysis and ordered probit analysis were used to analyze the data.

Results showed that the consistent trend in all the results of the models analyzed showed that belief factors are very paramount in respondents' consideration to patronize co-operative. The socio-economic and demographic factors were not statistically significant in the patronage of co-operative models. However, age, income and location were significant in membership status in co-operatives. The belief factor variables were significant for the four models. Knowledge score was only statistically significant in the intention towards product/services provided by co-operative. Knowing and understanding

the major principles of co-operatives seem to play a significant role in respondents' beliefs and their decision to patronize, join or remain as members of co-operatives. The fact is that knowledge impacts beliefs, beliefs impact attitudes and attitudes, in turn, impact behavior.

Four dependent variables were evaluated using discrete choice models. An ordered probit approach was used to estimate and evaluate the first two models (intention and consideration to patronize co-operatives), and multinomial logit models for the last two models (patronage of co-operatives in the last twelve months and membership status in co-operative). The respondents' ratings of their choices were the observed measures, and their attitudes and perceptions were the underlying unobserved (latent) measures.

7.2 Summary of the Models

Four questions from the questionnaire were used to model respondents' patronage, commitment, and participation in co-operatives. These included intention towards co-operative product/service, consideration to patronize co-operatives, use of co-operative in the last 12 months, and their membership status. These were the four dependent variables used in this study.

The initial expectation was that most of the socio-economic and demographic variables were expected to be related to the dependent variables but they turn out not to be statistically significant in the patronage related models. Belief factors were the main significant explanatory variables.

Results from a probit analysis on the intention to patronize co-operative indicate that variables associated with age, income, gender, and education do not have significant influences on patronage of co-operatives. It is the knowledge the people possess about co-operative, their residential location (mainly in urban areas), and their belief about the altruistic characteristics of co-operatives that have positive influence on their patronage and commitment to co-operatives. Belief factors were also relatively important in the second probit model which attempted to explain respondents' consideration to patronize co-operatives. The two probit models accurately predicted the outcomes 51.02 percent

and 61.90 percent of the time respectively. Overall, the success of the probit models were satisfactory. Although the predictions of the models were relatively good, each model involved some number of incorrect predictions as well. If this model was to be used as a main decision making tool, more analysis would need to be carried out to further validate the predictions.

The respondents who believe that co-operatives should care more about financial matters than environmental, socially responsible and community base matters are less likely to be current members of co-operatives, as indicated in the results. However, the results show that if never been members are more aware of, familiar with, and understand the concept of co-operatives and their attributes, they are more likely to become members of co-operatives. This will also increase peoples' patronage of co-operatives.

7.3 Implications of the Findings of the Study

The results of this study have implications for the management and interest groups of co-operatives. Given the limitations of this analysis, the following issues appear to be pertinent with regard to lessons and implications stemming from the findings of this study, as discussed in the sections above.

Knowledge. Lack of or low level of knowledge of the concept and principles of co-operatives reduces patronage and membership recruitment. The results show that lack of knowledge has a negative impact on patronage and lack of awareness has a negative impact on membership.

Co-operative management should not take for granted that people are aware and understand the concept of co-operatives. Efforts should be made to continually provide knowledge to the public. As stated earlier, co-operatives should be regarded as a product that should be marketed on a continual basis. It is not right for management to be complacent and take things for granted because of the altruistic nature of co-operative organization. Altruistic attributes do not seem enough to achieve high patronage and increased membership as indicated by the results. Knowledge would impact belief, and belief would impact attitude and attitude would impact behavior.

Information. Knowledge can not be impacted without information. The results regarding membership status showed that former members are mainly interested in co-operative financial performance. This group needs to be assured that there are advantages in being a co-operative member, in addition to profitability of the business. In this information era, people are constantly curious. There are also more options for information dissemination; therefore, information needs to be constantly provided to increase public knowledge and awareness about co-operatives.

As discussed earlier in the literature review, some studies have shown that members feel alienated by their co-operative. Financial information should be made more transparent and social and environmental activities of co-operatives should be highlighted and it should be promptly made available to the public in order to boost the co-operative image and increase awareness. Providing information on the comparative advantage of co-operatives over IOFs to the public will provide better information in their patronage and membership choice decisions. Management should be more transparent about the operations of business. If the business is robust, the members should know as owners and if it is not, they should be aware and be encouraged to participate in the solution process. They should be able to feel that they count very much, and not just one of the crowds as it is with the IOFs. This would empower members and lead them to increase patronage and commitment. In this way members would earn their membership status in the co-operative, probably reduce free-riding and increase their patronage as well. If the co-operative is doing well and the members are not aware of the details, there will be the tendency for them to feel that the grass is greener at the IOFs end.

Since membership is the heart of a co-operative, and members are not involved in the day to day activities, as these are conducted by their agents (management), members should be more inclusive. Management should constantly remind members that although there is no immediate penalty to individual members for lack of patronage, if enough members are disloyal the co-operative will cease to exist.

Lastly, a satisfied member will tell ten more people, thereby increasing membership and patronage. Studies have showed that membership of a family member in an organization could influence others to join.

Membership. Management should make provision for policies that would be directed towards the younger population. The results indicate that in the never been members, membership in co-operatives is likely to decrease with age. Therefore current membership status decreases with age too.

Income. Low income earners should also be encouraged to participate. Special incentives could be created to attract these categories of people.

Location. Co-operatives should reach out more to the rural population. The results show that rural respondents were likely to be former members and less likely to patronize co-operatives. As mentioned earlier a number of reasons could be responsible for this, ranging from proximity to hostile take-overs by larger and more powerful IOFs. However, there may be other niches within such communities that co-operatives can fulfill in order to create new opportunities especially in the rural areas and the thriving suburbs.

7.4 Suggestions for Future Research

The study showed that age and income variables are related to membership, however, these particular age or income groups were not identified. The same goes for the belief factors; it would be interesting to know which factors will impact a specific age or income groups of people in particular. This can be carried out through further investigation. It would also be helpful to examine the trends in the different co-operative sectors. The trends in consumer co-operatives might be different from those in producer co-operatives, and so on. Further research is needed to explore the factors responsible for remaining as members of co-operative.

7.5 Conclusion

The results summarized above show that there are other underlying reasons why co-operative members leave their co-operative that should be addressed that go beyond socio-economic and demographics reasons.

As stated in Chapter 1, co-operative organizations are unique; they are not like other businesses, hence they can not be operated in a 'business as usual' manner. The co-operative itself is a unique product that should be marketed to people, especially its members. This is because there is tendency for people to lose sight of the main objectives of the co-operative which is more altruistic, and relapse into unrealistic expectations, by placing it on the same pedestal as an IOF. In the same vein, the co-operative should make its structure attractive by offering (marketing) its comparative advantage over an IOF to its members and the public alike to promote member commitment.

Based on these results, it is suggested that in order to increase patronage and membership in co-operatives, management should be more transparent, and increase efforts towards educating the public about the concept of the co-operative and its comparative advantage. This could influence people's attitude towards co-operatives, and ultimately influence their behavior positively.

Information and programs should also be tailored to appeal to different membership status for effectiveness. Many of the services and products the co-operative provides, such as services to the community and serving as a competitive yardstick in the industry, have public good characteristics and they should be emphasized, capitalized on, and promoted as such.

Noting the problem of free riding may be an attractive recruitment tool. The public will always be willing to free ride and take advantage of the public good attributes of co-operatives. With the way things are with co-operatives at the moment, free-riding might be a good calling card for an 'open house' invitation to attract the never been members with open minds. This will serve as an avenue to show the never been members what co-operatives have over IOFs.

7.6 Limitations of the Study

Survey data was used in the analysis of this study and such data comes with limitations which are inherent to the method of collection and the design of the survey. Some of these areas are discussed as follows.

Low response rates might be due to uncooperative respondents, or errors in structuring the questions to solicit the needed information. The sample might not be representative enough, which might lead to coverage errors. Identifying target groups from a generic mailing list is a major problem in collecting survey data.

Incomplete account of the population of interest may also result from using outdated or incorrect addresses.

Respondent burden is another issue that could cause limitation in the study. If respondents have been bombarded with different surveys within that period of time, it might affect their response to the questions or their willingness to complete the questionnaire, or lead to outright refusal to complete the questionnaire. It was observed that some of the questionnaires that were partially completed did not have very useful information.

Distortions of measurement errors could also be a source of limitation. Measurement errors may arise as a result of faulty responses due to unclear questions, memory errors, deliberate distortion responses, inappropriate informants or mis-recording of responses.

Despite the foregoing limitations, the general results of this study point to the importance of the beliefs of respondents regarding co-operatives in influencing co-operative patronage and membership, more so than their socio-economic and demographic characteristics.

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Appendices

Appendix 1: Distribution of Responses to Statements on Familiarity and Understanding of Co-ops

Familiarity & Understanding Questions	Response		
	TRUE (+1)	FALSE (-1)	TOTAL
1. Purpose of formation	182 94.3%	11 5.7%	193
2. Advantage	173 91.1%	17 8.9%	190
3. Equity behaves like IOFs	138 72.6%	52 27.4%	190
4. Patronage distribution	183 96.3%	7 3.7%	190
5. One member one vote	167 89.3%	20 10.7%	187
6. Money back to local economy.	173 91.1%	17 8.9%	190

	Sureness of the Response Given							TOTAL
	Not sure at all	Not sure	Slightly sure	Indifferent	Slightly sure	Sure	Absolutely sure	
1. Purpose of formation	2 1.1%	4 2.1%	9 4.7%	9 4.7%	27 14.2%	92 48.4%	47 24.7%	190 100%
2. Advantage	3 1.6%	5 2.6%	4 2.1%	4 2.1%	27 14.1%	105 54.7%	44 22.9%	192 100%
3. Equity behaves like IOFs	5 2.6%	11 5.8%	6 3.1%	14 7.3%	49 25.7%	72 37.7%	34 17.8%	191 100%
4. Patronage distribution	1 0.5%	6 3.2%	7 3.7%	7 3.7%	27 14.2%	87 45.8%	55 28.9%	190 100%
5. One member one vote	2 1.1%	26 13.8%	16 8.5%	11 5.9%	44 23.4%	53 28.2%	36 19.1%	188 100%
6. Money back to local economy.	5 2.6%	10 5.3%	2 1.1%	6 3.2%	48 25.3%	87 45.8%	32 16.8%	190 100%

Belief Statements

- a A co-operative is a group of people doing business
 - b In terms of profits, doing business with a co-operative is better than with an IOF
 - c In terms of advantages, doing business with a co-operative is better than with an IOF
 - d Credit Unions (CU) are very similar to banks
 - e IOFs provide a greater number of products and services than co-operatives
 - f Co-operatives are more involved in community services than IOFs
 - g Co-operatives should worry more about profits than about social issues
 - h I have heard about co-operatives/credit unions but I am not familiar with the way they work
 - i Businesses should pay more attention to environmental issues than creating economic growth and employment
 - j Banks in Canada are making too much money
 - k I did not know that co-operatives /credit unions existed
 - l Eventually co-operatives as business enterprises will become publicly traded firms (IOFs)
 - m Credit Unions are less efficient than banks because they cannot operate nationwide
 - n The sale of Agricore and Dairyworld shakes my confidence in co-operatives
 - o There is no difference between large co-operatives and large private companies
 - p In order for credit unions to compete with banks, they will have to become more like banks, thus destroying their original distinction
 - q Banks offer better financial product/services than Credit Union
-

Appendix 3: Distribution of Responses to Belief Statement

<i>Belief Statements</i>	<i>Strongly disagree</i>	<i>Disagree</i>	<i>Slightly disagree</i>	<i>Indifferent</i>	<i>Slightly agree</i>	<i>Agree</i>	<i>Strongly agree</i>	<i>TOTAL</i>
Belief a	4 2.1%	7 3.7%	2 1.1%	4 2.1%	23 12.1%	112 58.9%	38 20.0%	190 100%
Belief b	2 1.1%	21 11.5%	10 5.5%	64 35.0%	32 17.5%	45 24.6%	9 4.9%	183 100%
Belief c	2 1.1%	20 10.9%	9 4.9%	61 33.3%	41 22.4%	41 22.4%	9 4.9%	183 100%
Belief d	3 1.6%	17 9.0%	18 9.5%	12 6.3%	47 24.9%	76 40.2%	16 8.5%	189 100%
Belief e	5 2.7%	29 15.8%	24 13.1%	58 31.7%	32 17.5%	28 15.3%	7 3.8%	183 100%
Belief f	2 1.1%	16 8.5%	5 2.7%	53 28.2%	39 20.7%	56 29.8%	17 9.0%	188 100%
Belief g	9 4.9%	39 21.2%	40 21.7%	49 26.6%	26 14.1%	16 8.7%	5 2.7%	184 100%
Belief h	23 12.6%	51 28.0%	35 19.2%	22 12.1%	24 13.2%	18 9.9%	9 4.9%	182 100%
Belief i	13 6.9%	31 16.4%	40 21.2%	31 16.4%	41 21.7%	24 12.7%	9 4.8%	189 100%
Belief j	6 3.2%	6 3.2%	5 2.7%	7 3.7%	23 12.2%	47 25.0%	94 50.0%	188 100%
Belief k	130 69.5%	40 21.4%	5 2.7%	5 2.7%	2 1.1%	2 1.1%	3 1.6%	187 100%
Belief l	17 9.3%	54 29.7%	18 9.9%	65 35.7%	17 9.3%	7 3.8%	4 2.2%	182 100%
Belief m	23 12.2%	52 27.5%	26 13.8%	38 20.1%	27 14.3%	19 10.1%	4 2.1%	189 100%
Belief n	10 5.4%	29 15.8%	9 4.9%	95 51.6%	23 12.5%	13 7.1%	5 2.7%	184 100%
Belief o	21 11.3%	73 39.2%	43 23.1%	20 10.8%	18 9.7%	11 5.9%	0 0.0%	186 100%
Belief p	16 8.6%	57 30.5%	39 20.9%	25 13.4%	31 16.6%	18 9.6%	1 0.5%	187 100%
Belief q	23 12.2%	48 25.4%	24 12.7%	47 24.9%	29 15.3%	16 8.5%	2 1.1%	189 100%

*** After Principal component analysis, the number of valid observations reduced to 171. All samples with incomplete responses were eliminated in the process.

Appendix 4: Independent Variables

Variable	Description	Recodes	Description (Recode)
Age	<u>Age Categories of Respondents</u>		
Codes	1 ≤ 20 years		
	2 21-34 years	1	21-34 years
	3 35-44 years	2	35-44 years
	4 45-54 years	3	45-54 years
	5 ≥ 55 years	4	≥ 55 years
Gender	<u>Gender of Respondents</u>		
Codes	1 Female		
	0 Male		
Education	<u>Level of Education Achieved by Respondents</u>		
Codes	1 No School at all		
	2 Grade School		
	3 Some High School	1	Less than High School
	4 High School	2	High School
	5 College Tech.	3	College/Technical School
	6 University	4	University
	7 Graduate School	5	Graduate School
Income	<u>Categories of Annual gross income of Respondents (before tax)</u>		
Codes	1 ≤ \$49	1	≤ \$49
	2 \$50 – 99	2	\$50 – 99
	3 \$100 - \$149	3	\$100 - \$149
	4 \$150 - \$199	4	\$150 - \$199
	5 ≥ \$250	5	≥ \$250
Residence	<u>Location of Respondents</u>		
Codes	0 Urban	0	Urban
	1 Rural	1	Rural
Knowledge score	<u>Respondents familiarity and understanding of co-operative concepts</u>		
Mean	Mean values of the scores	Range between -22.33 to 100	
Factors	<u>Belief statement factors</u>		Codes
Factor 1	Financial roles beliefs		FAC1_2
Factor 2	Economic and social responsibility belief		FAC2_2
Factor 3	Awareness co-operatives beliefs		FAC3_2
Factor 4	Similarity of Credit Unions and banks belief		FAC4_2
Factor 5	Capitalistic belief		FAC5_2
Factor 6	Definition statement belief		FAC6_2

Appendix 5: Dependent Variables

<i>Variable Name</i>	<i>Recoded Variable Name</i>	<i>Description</i>
Old Codes	New Codes	
PRODUCTX	INTENT	<i>If it was said that product/service X (one that you buy) is provided by a co-operative organization, how would it affect your intentions towards the product?</i>
1	0	More inclined NOT to purchase
2	0	Inclined NOT to purchase
3	0	Slightly inclined NOT to purchase
4	0	Indifferent
5	1	Slightly inclined to purchase
6	2	Inclined to purchase
7	3	More inclined to purchase
COOPPATR	PATRONC	<i>Would you consider patronizing co-operative if you knew that co-operative offer good prices, good services, and quality products, contributes to the community, and offers good price discount for members?</i>
1	0	Extremely unlikely
2	0	Unlikely
3	0	Slightly unlikely
4	0	Not sure
5	1	Slightly likely
6	2	Likely
7	3	Extremely Likely
COOPUSE	RCCOOPUS	<i>Have you used or purchased services or products of a co-operative in the past 12 months?</i>
1	0	Yes, I Have
2	1	No, I have not
3	2	I might, but do not know
MEMSTATUS	MEMSTATUS	<i>Membership status in co-operative</i>
0	0	Current Member
1	1	Never Member
2	2	Former Member

Appendix 6: Crosstabulation of Age Vs. Other Variables

Variables	Classification	Age of respondent (Years)								Total	
		21-34		35-44		45-54		Over 55			
Gender indicate by respondent	Female	11	50%	11	22.9%	15	28.8%	11	16.4%	48	100%
	Male	11	50%	18	14.8%	37	71.2%	56	83.6%	122	100%
	Total	22	100%	29	17.1%	52	100%	67	100%	170	100%
Income level (\$'000's)	< \$49	12	54.5%	12	16.2%	15	30.0%	35	54.7%	74	100%
	\$50-99	9	40.9%	13	20.3%	22	44.0%	20	31.3%	64	100%
	\$100-149	1	4.5%	3	18.8%	8	16.0%	4	6.3%	16	100%
	\$150-199	0	0%	1	14.3%	4	8.0%	2	3.1%	7	100%
	>\$250	0	0%	0	0%	1	2.0%	3	4.7%	4	100%
	Total	22	100%	29	18%	50	100%	64	100%	165	100%
Level of education	< High school	1	4.5%	0	0%	3	5.9%	10	14.7%	14	100%
	High School	4	18.2%	8	21.6%	11	21.6%	14	20.6%	37	100%
	College Tech.	6	27.3%	12	24.5%	11	21.6%	20	29.4%	49	100%
	University	8	36.4%	9	18.0%	14	27.5%	19	27.9%	50	100%
	Grad School	3	13.6%	0	0%	12	23.5%	5	7.4%	20	100%
	Total	22	100%	29	17%	51	100%	68	100%	170	100%
Resident location	Urban	19	86.4%	18	14.9%	41	78.8%	43	66.2%	121	100%
	Rural	3	13.6%	10	21.7%	11	21.2%	22	33.8%	46	100%
	Total	22	100%	28	17%	52	100%	65	100%	167	100%
Intention to purchase from Co-operatives	More Inclined	0	0%	0	0%	1	2%	0	0%	1	100%
	Inclined not	0	0%	0	0%	0	0%	1	2%	1	100%
	Slightly Inclined	0	0%	0	0%	0	0%	0	0%	0	0%
	Indifferent	9	40.9%	10	16.9%	18	34.6%	22	32.8%	59	100%
	Slightly Inclined	4	18.2%	10	29.4%	13	25.0%	7	10.4%	34	100%
	Inclined	6	27.3%	5	10.0%	13	25.0%	26	38.8%	50	100%
	More Inclined	3	13.6%	4	16.0%	7	13.5%	11	16.4%	25	100%
	Total	22	100%	29	17%	52	100%	67	100%	170	100%
Consideration to patronize Co-operatives	Extremely Unlikely	0	0%	0	0%	0	0%	2	2.9%	2	100%
	Slightly Unlikely	0	0%	1	33.3%	2	3.8%	0	0%	3	100%
	Unlikely	0	0%	0	0%	0	0%	0	0%	0	0%
	Not Sure	0	0%	0	0%	0	0%	5	7.4%	5	100%
	Slight Likely	0	0%	4	22.2%	9	17.3%	5	7.4%	18	100%
	Likely	12	54.5%	15	18.3%	29	55.8%	26	38.2%	82	100%
	Extremely Likely	10	45.5%	9	14.8%	12	23.1%	30	44.1%	61	100%
	Total	22	100%	29	17%	52	100%	68	100%	171	100%
Patronage of co-operatives in the last 12 months	Yes	13	59.1%	17	15.3%	31	62.0%	50	75.8%	111	100%
	No	4	18.2%	5	15.6%	13	26.0%	10	15.2%	32	100%
	Might	5	22.7%	5	22.7%	6	12.0%	6	9.1%	22	100%
	Total	22	100%	27	16%	50	100%	66	100%	165	100%
Membership Status	Current	10	9.9%	14	13.9%	29	28.7%	48	47.5%	101	100%
	Never	8	17.8%	13	28.9%	13	28.9%	11	24.4%	45	100%
	Former	4	16.7%	2	8.3%	10	41.7%	8	33.3%	24	100%
	Total	22	100%	29	100%	52	100%	67	100%	170	100%

Appendix 7: Crosstabulation of Gender Vs. Other Variables

Variables		Gender of Respondents				Total	
		Female		Male			
Age of respondent	21-34	11	22.9%	11	9.0%	22	100%
	35-44	18	22.9%	18	14.8%	29	100%
	45-54	37	31.3%	37	30.3%	52	100%
	Over 55	56	22.9%	56	45.9%	67	100%
	Total	122	100%	122	100%	170	100%
Income level (\$'000)	< \$49	46	58.7%	46	39.0%	73	100%
	\$50-99	48	34.8%	48	40.7%	64	100%
	\$100-149	15	2.2%	15	12.7%	16	100%
	\$150-199	5	4.3%	5	4.2%	7	100%
	>\$250	4	0%	4	3.4%	4	100%
	Total	118	100%	118	100%	164	100%
Level of education	< High school	12	4.2%	12	9.9%	14	100%
	High School	26	22.9%	26	21.5%	37	100%
	College Tech.	33	31.3%	33	27.3%	48	100%
	University	36	29.2%	36	29.8%	50	100%
	Grad School	14	12.5%	14	11.6%	20	100%
	Total	121	100%	121	100%	169	100%
Location of Residence	Urban	91	63.8%	91	76.5%	121	100%
	Rural	28	36.2%	28	23.5%	45	100%
	Total	119	100%	119	100%	166	100%
Intention to purchase from Co-operatives	More Inclined	1	0%	1	0.8%	1	100%
	Inclined not	1	0%	1	0.8%	1	100%
	Slightly Inclined	0	0%	0	0%	0	0%
	Indifferent	41	37.5%	41	33.9%	59	100%
	Slightly Inclined	24	20.8%	24	19.8%	34	100%
	Inclined	37	27.1%	37	30.6%	50	100%
	More Inclined	17	14.6%	17	14.0%	24	100%
	Total	121	100%	121	100%	169	100%
Consideration to patronize Co-operatives	Extremely Unlikely	2	0%	2	2%	2	100%
	Slightly Unlikely	3	0%	3	2.5%	3	100%
	Unlikely	0	0%	0	0%	0	0%
	Not Sure	4	2.1%	4	3.3%	5	100%
	Slight Likely	13	10.4%	13	10.7%	18	100%
	Likely	58	50.0%	58	47.5%	82	100%
	Extremely Likely	42	37.5%	42	34.4%	60	100%
	Total	122	100%	122	100%	170	100%
Use of co-operatives in the last 12 months	Yes	80	63.8%	80	68.4%	110	100%
	No	25	14.9%	25	21.4%	32	100%
	Might	12	21.3%	12	10.3%	22	100%
	Total	117	100%	117	100%	164	100%
Membership Status	Current	24	24.0%	76	76.0%	100	100%
	Never	18	40.0%	27	60.0%	45	100%
	Former	6	25.0%	18	75.0%	24	100%
	Total	48	100%	121	100%	169	100%

Appendix 8: Crosstabulation of Income Vs. Other Variables

		Respondents' Income level (\$'000)										Total	
		< \$49		\$50-99		\$100-149		\$150-199		>\$250			
Age of respondent													
	21-34	12	16.2%	9	14.1%	1	6.3%	0	0.0%	0	0.0%	22	100%
	35-44	12	16.2%	13	20.3%	3	18.8%	1	14.3%	0	0.0%	29	100%
	45-54	15	20.3%	22	34.4%	8	50.0%	4	57.1%	1	25.0%	50	100%
	Over 55	35	47.3%	20	31.3%	4	25.0%	2	28.6%	3	75.0%	64	100%
	Total	74	100%	64	100%	16	100%	7	100%	4	100%	165	100%
Gender													
	Female	27	37.0%	16	25.0%	1	6.3%	2	28.6%	0	0%	46	100%
	Male	46	63.0%	48	75.0%	15	93.8%	5	71.4%	4	100.0%	118	100%
	Total	73	100%	64	100%	16	100%	7	100%	4	100%	164	100%
Level of education													
	< High School	10	13.5%	3	4.8%	1	6.3%	0	0%	0	0%	14	100%
	High School	19	25.7%	11	17.5%	3	18.8%	1	14.3%	2	50.0%	36	100%
	College Tech.	22	29.7%	21	33.3%	3	18.8%	0	0%	1	25.0%	47	100%
	University	16	21.6%	21	33.3%	6	37.5%	4	57.1%	1	25.0%	48	100%
	Grad Sch	7	9.5%	7	11.1%	3	18.8%	2	28.6%	0	0%	19	100%
	Total	74	100%	63	100%	16	100%	7	100%	4	100%	164	100%
Location of Residence													
	Urban	42	57.5%	51	82.3%	14	93.3%	6	85.7%	2	50.0%	115	100%
	Rural	31	42.5%	11	17.7%	1	6.7%	1	14.3%	2	50.0%	46	100%
	Total	73	100%	62	100%	15	100%	7	100%	4	100%	161	100%
Intention to purchase from Co-operatives													
	More Inclined	1	1.4%	0	0%	0	0%	0	0%	0	0%	1	100%
	Inclined not	1	1.4%	0	0%	0	0%	0	0%	0	0%	1	100%
	Slightly inclined	20	27.0%	26	41%	7	44%	3	43%	1	25%	57	100%
	Indifferent	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
	Slightly Inclined	16	21.6%	15	23.8%	1	6.3%	2	28.6%	0	0%	34	100%
	Inclined	27	36.5%	14	22.2%	6	37.5%	1	14.3%	1	25.0%	49	100%
	More Inclined	9	12.2%	8	12.7%	2	12.5%	1	14.3%	2	50.0%	22	100%
	Total	74	100.0%	63	100.0%	16	100.0%	7	100.0%	4	100.0%	164	100%
Consideration to patronize Co-operatives													
	Extremely unlikely	0	0%	1	1.6%	0	0%	0	0%	1	25%	2	100%
	Slightly unlikely	2	2.7%	1	1.6%	0	0%	0	0.0%	0	0.0%	3	100%
	Unlikely	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
	Not Sure	3	4.1%	2	3.1%	0	0%	0	0%	0	0%	5	100%
	Slightly Likely	7	9.5%	7	10.9%	4	25.0%	0	0.0%	0	0.0%	18	100%
	Likely	39	52.7%	26	40.6%	9	56.3%	4	57.1%	0	0.0%	78	100%
	Extremely Likely	23	31.1%	27	42.2%	3	18.8%	3	42.9%	3	75.0%	59	100%
	Total	74	100%	64	100%	16	100%	7	100%	4	100%	165	100%
Use of co-operatives in the last 12 months													
	Yes	51	70.8%	37	60.7%	10	62.5%	7	100%	3	100%	108	100%
	No	9	12.5%	19	31.1%	4	25.0%	0	0%	0	0%	32	100%
	Might	12	16.7%	5	8.2%	2	12.5%	0	0%	0	0%	19	100%
	Total	72	100%	61	100%	16	100%	7	100%	3	100%	159	100%
Membership Status													
	Current	43	43.9%	36	36.7%	8	8.2%	7	7.1%	4	4.1%	98	100%
	Never	23	53.5%	17	39.5%	3	7.0%	0	0%	0	0.0%	43	100%
	Former	8	33.3%	11	45.8%	5	20.8%	0	0%	0	0.0%	24	100%
	Total	74	100%	64	100%	16	100%	7	100%	4	100%	165	100%

Appendix 9: Crosstabulation of Level of Education Vs. Other Variables

		Level of education achieved										Total	
		< High Sch		High School		Coll /Tech		University		Grad School			
Age of respondent													
21-34	1	7.1%	4	10.8%	6	12.2%	8	16.0%	3	15.0%	22	100%	
35-44	0	0.0%	8	21.6%	12	24.5%	9	18.0%	0	0.0%	29	100%	
45-54	3	21.4%	11	29.7%	11	22.4%	14	28.0%	12	60.0%	51	100%	
Over 55	10	71.4%	14	37.8%	20	40.8%	19	38.0%	5	25.0%	68	100%	
Total	14	100%	37	100%	49	100%	50	100%	20	100%	170	100%	
Gender													
Female	2	14%	11	29.7%	15	31%	14	28.0%	6	30.0%	48	100%	
Male	12	86%	26	70.3%	33	69%	36	72.0%	14	70.0%	121	100%	
Total	14	100%	37	100.0%	48	100%	50	100.0%	20	100.0%	169	100%	
Income level (\$'000)													
< \$49	10	71.4%	19	52.8%	22	46.8%	16	33.3%	7	36.8%	74	100%	
\$50-99	3	21.4%	11	30.6%	21	44.7%	21	43.8%	7	36.8%	63	100%	
\$100-149	1	7.1%	3	8.3%	3	6.4%	6	12.5%	3	15.8%	16	100%	
\$150-199	0	0%	1	2.8%	0	0%	4	8.3%	2	10.5%	7	100%	
>\$250	0	0%	2	6%	1	2%	1	2%	0	0%	4	100%	
Total	14	100%	36	100%	47	100%	48	100%	19	100%	164	100%	
Location of Residence													
Urban	6	42.9%	23	63.9%	35	71.4%	37	78.7%	19	95.0%	120	100%	
Rural	8	57.1%	13	36.1%	14	28.6%	10	21.3%	1	5.0%	46	100%	
Total	14	100%	36	100%	49	100%	47	100%	20	100%	166	100%	
Intention to purchase from Co-operatives													
More Inclined	0	0%	0	0%	1	2%	0	0%	0	0%	1	100%	
Inclined not	0	0%	0	0%	1	2%	0	0%	0	0%	1	100%	
Slightly Inclined	2	15%	12	32%	19	39%	19	38%	6	30%	58	100%	
Indifferent	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	
Slightly Inclined	2	15.4%	5	13.5%	13	26.5%	9	18.0%	5	25.0%	34	100%	
Inclined	7	53.8%	12	32.4%	9	18.4%	16	32.0%	6	30.0%	50	100%	
More Inclined	2	15.4%	8	21.6%	6	12.2%	6	12.0%	3	15.0%	25	100%	
Total	13	100%	37	100%	49	100%	50	100%	20	100%	169	100%	
Consideration to patronize Co-operatives													
Extremely unlikely	0	0%	0	0%	0	0%	2	4%	0	0%	2	100%	
Slightly unlikely	0	0%	1	2.7%	1	2%	1	2.0%	0	0.0%	3	100%	
Unlikely	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	
Not Sure	1	7%	1	3%	2	4%	1	2%	0	0%	5	100%	
Slightly Likely	2	14%	6	16.2%	4	8%	5	10.0%	1	5.0%	18	100%	
Likely	5	35.7%	13	35.1%	28	57.1%	25	50.0%	11	55.0%	82	100%	
Extremely Likely	6	42.9%	16	43.2%	14	28.6%	16	32.0%	8	40.0%	60	100%	
Total	14	100%	37	100%	49	100%	50	100%	20	100%	170	100%	
Use of co-operatives in the last 12 months													
Yes	8	61.5%	26	74.3%	33	67.3%	32	66.7%	12	60.0%	111	100%	
No	4	30.8%	3	8.6%	11	22.4%	10	20.8%	4	20.0%	32	100%	
Might	1	7.7%	6	17.1%	5	10.2%	6	12.5%	4	20.0%	22	100%	
Total	13	100%	35	100%	49	100%	48	100%	20	100%	165	100%	
Membership Status													
Current	9	9.0%	23	23.0%	30	30.0%	28	28.0%	10	10.0%	100	100%	
Never	3	6.7%	8	17.8%	14	31.1%	13	28.9%	7	15.6%	45	100%	
Former	2	8.3%	5	20.8%	5	20.8%	9	37.5%	3	12.5%	24	100%	
Total	14	100%	36	100%	49	100%	50	100%	20	100%	169	100%	

Appendix 10: Crosstabulation of Location of Residence Vs. Other Variables

Variables	Classification	Location of Residence				Total	
		Urban	Rural				
Age of respondent	21-34	19	15.7%	3	6.5%	22	100%
	35-44	18	14.9%	10	21.7%	28	100%
	45-54	41	33.9%	11	23.9%	52	100%
	Over 55	43	35.5%	22	47.8%	65	100%
	Total	121	100%	46	100%	167	100%
Gender	Female	30	24.8%	17	37.8%	47	100%
	Male	91	75.2%	28	62.2%	119	100%
	Total	121	100%	45	100%	166	100%
Income level (\$'000)	< \$49	42	36.5%	31	67.4%	73	100%
	\$50-99	51	44.3%	11	23.9%	62	100%
	\$100-149	14	12.2%	1	2.2%	15	100%
	\$150-199	6	5.2%	1	2.2%	7	100%
	>\$250	2	1.7%	2	4.3%	4	100%
	Total	115	100%	46	100%	161	100%
Level of education	< High school	6	5.0%	8	17.4%	14	100%
	High School	23	19.2%	13	28.3%	36	100%
	College /Tech.	35	29.2%	14	30.4%	49	100%
	University	37	30.8%	10	21.7%	47	100%
	Grad school	19	15.8%	1	2.2%	20	100%
	Total	120	100%	46	100%	166	100%
Intention to purchase from Co-operatives	More Inclined	0	0.0%	1	2.2%	1	100%
	Inclined not	0	0.0%	1	2.2%	1	100%
	Slightly Inclined	49	40.5%	8	17.8%	57	100%
	Indifferent	0	0.0%	0	0.0%	0	0%
	Slightly Inclined	23	19.0%	10	22.2%	33	100%
	Inclined	31	25.6%	18	40.0%	49	100%
	More Inclined	18	14.9%	7	15.6%	25	100%
	Total	121	100%	45	100%	166	100%
Consideration to patronize Co-operatives	Extremely unlikely	2	1.7%	0	0.0%	2	100%
	Slightly unlikely	3	2.5%	0	0.0%	3	100%
	Unlikely	0	0.0%	0	0.0%	0	0%
	Not Sure	3	2.5%	2	4.3%	5	100%
	Slightly Likely	9	7.4%	6	13.0%	15	100%
	Likely	64	52.9%	18	39.1%	82	100%
	Extremely Likely	40	33%	20	44%	60	100%
	Total	121	100%	46	100%	167	100%
Use of co-operatives in the last 12 months	Yes	75	64%	33	73%	108	100%
	No	24	21%	8	18%	32	100%
	Might	18	15%	4	9%	22	100%
	Total	117	100%	45	100%	162	100%
Membership Status	Current	67	68.4%	31	31.6%	98	100%
	Never	32	72.7%	12	27.3%	44	100%
	Former	21	87.5%	3	12.5%	24	100%
	Total	120	100%	46	100%	166	100%

Appendix 11: Crosstabulation of Mean Knowledge Score Vs. Other Variables

<i>Independent Variables</i>		N	% of Total Sum	% of Total N	Mean Knowledge Score (%)
Age of respondent	21-34	22	11.0%	12.9%	53.1
	35-44	29	16.5%	17.0%	60.4
	45-54	52	30.7%	30.4%	62.6
	Over 55	68	41.7%	39.8%	65.1
	Total	171	100%	100%	62.0
Gender	Female	48	29.1%	28.2%	63.7
	Male	122	70.9%	71.8%	61.0
	Total	170	100%	100%	61.8
Income level (\$'000's))	<\$49	74	45.9%	44.8%	63.1
	\$50-99	64	38.3%	38.8%	61.0
	\$100-149	16	9.1%	9.7%	57.6
	\$150-199	7	3.5%	4.2%	51.5
	>\$250	4	3.2%	2.4%	81.2
	Total	165	100%	100%	61.7
Level of education	< High Sch	14	7.9%	8.2%	59.5
	High School	37	24.9%	21.8%	71.2
	College Tech.	49	29.0%	28.8%	62.7
	University	50	29.3%	29.4%	62.1
	Grad Sch	20	9.0%	11.8%	47.5
	Total	170	100%	100%	62.3
Resident location	Urban	121	71.8%	72.5%	62.5
	Rural	46	28.2%	27.5%	64.6
	Total	167	100%	100%	63.1
Dependent Variables					
Intention to purchase from Co-operatives	More Inclined no t	1	0.2%	0.6%	17.0
	Inclined not	1	0.4%	0.6%	47.3
	Slightly Inclined not	0	0%	0%	0%
	Indifferent	59	29.5%	34.7%	52.8
	Slightly Inclined	34	19.7%	20.0%	61.1
	Inclined	50	31.1%	29.4%	65.8
	More Inclined	25	19.1%	14.7%	80.7
	Total	170	100%	100%	62.1
Consideration to patronize Co-operatives	Extremely Unlikely	2	0.8%	1.2%	40.3
	Slightly Unlikely	0	0%	0%	0%
	Unlikely	3	1.5%	1.8%	53.7
	Not Sure	5	3.1%	2.9%	65.5
	Slightly Likely	18	9.6%	10.5%	56.4
	Likely	82	46.8%	48.0%	60.5
	Extremely Likely	61	38.3%	35.7%	66.5
	Total	171	100%	100%	62.0
Use of co-operatives in the last 12 months	Yes	111	72.1%	67.3%	66.9
	No	32	15.7%	19.4%	50.5
	Might	22	12.2%	13.3%	57.2
	Total	165	100%	100%	62.4
Membership Status	Current	101	64.3%	59.4%	67.3
	Never	45	22.5%	26.5%	52.9
	Former	24	13.1%	14.1%	57.7
	Total	170	100%	100%	62.1

Appendix 12: Crosstabulation of Intention to Vs Other Variables

	Intentions of purchasing X product from a coop												Total	
	More Inc. not		Inclined not		Indifferent		Slightly Inclined		Inclined		More Inclined			
Age of respondent														
21-34	0	0.0%	0	0.0%	9	15.3%	4	11.8%	6	12.0%	3	12%	22	100%
35-44	0	0.0%	0	0.0%	10	16.9%	10	29.4%	5	10.0%	4	16%	29	100%
45-54	1	100%	0	0.0%	18	30.5%	13	38.2%	13	26.0%	7	28%	52	100%
Over 55	0	0.0%	1	100%	22	37.3%	7	20.6%	26	52.0%	11	44%	67	100%
Total	1	100%	1	100%	59	100%	34	100%	50	100%	25	100%	170	100%
Gender														
Female	0	0%	0	0.0%	18	31%	10	29.4%	13	26.0%	7	29%	48	100%
Male	1	100%	1	100%	41	70%	24	70.6%	37	74.0%	17	71%	121	100%
Total	1	100%	1	100%	59	100%	34	100%	50	100%	24	100%	169	100%
Income level (\$'000)														
< \$49	1	100%	1	100%	20	35.1%	16	47.1%	27	55.1%	9	41%	74	100%
\$50-99	0	0%	0	0.0%	26	45.6%	15	44.1%	14	28.6%	8	36%	63	100%
\$100-149	0	0%	0	0.0%	7	12.3%	1	2.9%	6	12.2%	2	9%	16	100%
\$150-199	0	0%	0	0.0%	3	5%	2	5.9%	1	2.0%	1	5%	7	100%
>\$250	0	0%	0	0%	1	2%	0	0%	1	2%	2	9%	4	100%
Total	1	100%	1	100%	57	100%	34	100%	49	100%	22	100%	164	100%
Level of education														
< High Sch.	0	0.0%	0	0%	2	3.4%	2	6%	7	14%	2	8%	13	100%
High School	0	0.0%	0	0.0%	12	20.7%	5	14.7%	12	24.0%	8	32%	37	100%
Colle/ Tech.	1	100%	1	100%	19	32.8%	13	38.2%	9	18.0%	6	24%	49	100%
University	0	0.0%	0	0.0%	19	32.8%	9	26.5%	16	32.0%	6	24%	50	100%
Grad Sch.	0	0.0%	0	0%	6	10.3%	5	15%	6	12%	3	12%	20	100%
Total	1	100%	1	100%	58	100%	34	100%	50	100%	25	100%	169	100%
Location of Residence														
Urban	0	0.0%	0	0.0%	49	86.0%	23	69.7%	31	63.3%	18	72%	121	100%
Rural	1	100%	1	100%	8	14.0%	10	30.3%	18	36.7%	7	28%	45	100%
Total	1	100%	1	100%	57	100%	33	100%	49	100%	25	100%	166	100%
Consideration to patronize Co-operatives														
Extr Unlikely	0	0%	0	0%	2	3%	0	0%	0	0%	0	0%	2	100%
Slig Unlikely	0	0%	0	0.0%	2	3%	1	2.9%	0	0.0%	0	0%	3	100%
Unlikely	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Not Sure	0	0%	0	0%	4	7%	0	0%	1	2%	0	0%	5	100%
Slight Likely	0	0%	1	100%	8	14%	7	20.6%	2	4.0%	0	0%	18	100%
Likely	1	100%	0	0.0%	31	52.5%	17	50.0%	28	56.0%	5	20%	82	100%
Extrm. Likely	0	0%	0	0.0%	12	20.3%	9	26.5%	19	38.0%	20	80%	60	100%
Total	1	100%	1	100%	59	100%	34	100%	50	100%	25	100%	170	100%
Use of co-operatives in the last 12 months														
Yes	0	00%	1	100%	34	58.6%	23	71.9%	33	68.8%	19	79%	110	100%
No	1	100%	0	0.0%	14	24.1%	6	18.8%	10	20.8%	1	4%	32	100%
Might	0	0.0%	0	0.0%	10	17.2%	3	9.4%	5	10.4%	4	17%	22	100%
Total	1	100%	1	100%	58	100%	32	100%	48	100%	24	100%	164	100%
Membership Status														
Current	0	0%	1	1.0%	26	26.0%	23	23.0%	32	32.0%	18	18%	100	100%
Never	1	2.20%	0	0%	18	40.0%	9	20.0%	14	31.1%	3	6.7%	45	100%
Former	0	0%	0	0%	14	58.3%	2	8.3%	4	16.7%	4	16.7%	24	100%
Total	1	100%	1	100%	58	100%	34	100%	50	100%	25	100%	169	100%

Appendix 13: Crosstabulation of Consideration to Patronize Co-op Vs. Other Variables

Variables	Consideration to patronize Co-operatives												Total	
	Extremely Unlikely		Unlikely		Not sure		Slightly unlikely		Likely		Extremely Likely			
Age of respondent														
21-34	0	0.0%	0	0.0%	0	0.0%	0	0.0%	12	14.6%	10	16%	22	100%
35-44	0	0.0%	1	33.3%	0	0.0%	4	22.2%	15	18.3%	9	15%	29	100%
45-54	0	0.0%	2	66.7%	0	0.0%	9	50.0%	29	35.4%	12	20%	52	100%
Over 55	2	100%	0	0.0%	5	100.0%	5	27.8%	26	31.7%	30	49%	68	100%
Total	2	100%	3	100%	5	100%	18	100%	82	100%	61	100%	171	100%
Gender indicate by respondent														
Female	0	0%	0	0.0%	1	20%	5	27.8%	24	29.3%	18	30%	48	100%
Male	2	100%	3	100.0%	4	80%	13	72.2%	58	70.7%	42	70%	122	100%
Total	2	100%	3	100%	5	100%	18	100%	82	100%	60	100%	170	100%
Income level (\$'000)														
< \$49	0	0.0%	2	66.7%	3	60.0%	7	38.9%	39	50.0%	23	39%	74	100%
\$50-99	1	50.0%	1	33.3%	2	40.0%	7	38.9%	26	33.3%	27	46%	64	100%
\$100-149	0	0.0%	0	0.0%	0	0.0%	4	22.2%	9	11.5%	3	5%	16	100%
\$150-199	0	0%	0	0.0%	0	0%	0	0.0%	4	5.1%	3	5%	7	100%
>\$250	1	50%	0	0%	0	0%	0	0%	0	0%	3	5%	4	100%
Total	2	100%	3	100%	5	100%	18	100%	78	100%	59	100%	165	100%
Level of education														
less high school	0	0.0%	0	0%	1	20.0%	2	11%	5	6%	6	10%	14	100%
High School	0	0.0%	1	33.3%	1	20.0%	6	33.3%	13	15.9%	16	27%	37	100%
College Tech.	0	0.0%	1	33.3%	2	40.0%	4	22.2%	28	34.1%	14	23%	49	100%
University	2	100%	1	33.3%	1	20.0%	5	27.8%	25	30.5%	16	27%	50	100%
Grad School	0	0.0%	0	0%	0	0.0%	1	6%	11	13%	8	13%	20	100%
Total	2	100%	3	100%	5	100%	18	100%	82	100%	60	100%	170	100%
Location of Residence														
Urban	2	100%	3	100.0%	3	60.0%	9	60.0%	64	78.0%	40	67%	121	100%
Rural	0	0.0%	0	0.0%	2	40.0%	6	40.0%	18	22.0%	20	33%	46	100%
Total	2	100%	3	100%	5	100%	15	100%	82	100%	60	100%	167	100%
Intention to purchase from Co-operatives														
More Inclined no t	0	0%	0	0%	0	0%	0	0%	1	1%	0	0%	1	100%
Inclined not	0	0%	0	0%	0	0%	1	6%	0	0%	0	0%	1	100%
Slightly Inclined not	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0%	0
Indifferent	2	100%	2	66.7%	4	80.0%	8	44.4%	31	37.8%	12	20%	59	100%
Slightly Inclined	0	0.0%	1	33.3%	0	0.0%	7	38.9%	17	20.7%	9	15%	34	100%
Inclined	0	0.0%	0	0.0%	1	20.0%	2	11.1%	28	34.1%	19	32%	50	100%
More Inclined	0	0.0%	0	0.0%	0	0.0%	0	0.0%	5	6.1%	20	33%	25	100%
Total	2	100%	3	100%	5	100%	18	100%	82	100%	60	100%	170	100%
Use of co-operatives in the last 12 months														
Yes	1	50.0%	2	66.7%	2	40.0%	9	52.9%	49	59.8%	48	86%	111	100%
No	1	50.0%	1	33.3%	3	60.0%	6	35.3%	18	22.0%	3	5%	32	100%
Might	0	0.0%	0	0.0%	0	0.0%	2	11.8%	15	18.3%	5	9%	22	100%
Total	2	100%	3	100%	5	100%	17	100%	82	100%	56	100%	165	100%
Membership Status														
Current	1	1%	0	0%	2	2.0%	8	7.9%	45	44.6%	45	44.6%	101	100%
Never	1	2.20%	2	4%	2	4.4%	6	13.3%	24	53.3%	10	22.2%	45	100%
Former	0	0%	1	4%	1	4.2%	4	16.7%	13	54.2%	5	20.8%	24	100%
Total	2	100%	3	100%	5	100%	18	100%	82	100%	60	100%	170	100%

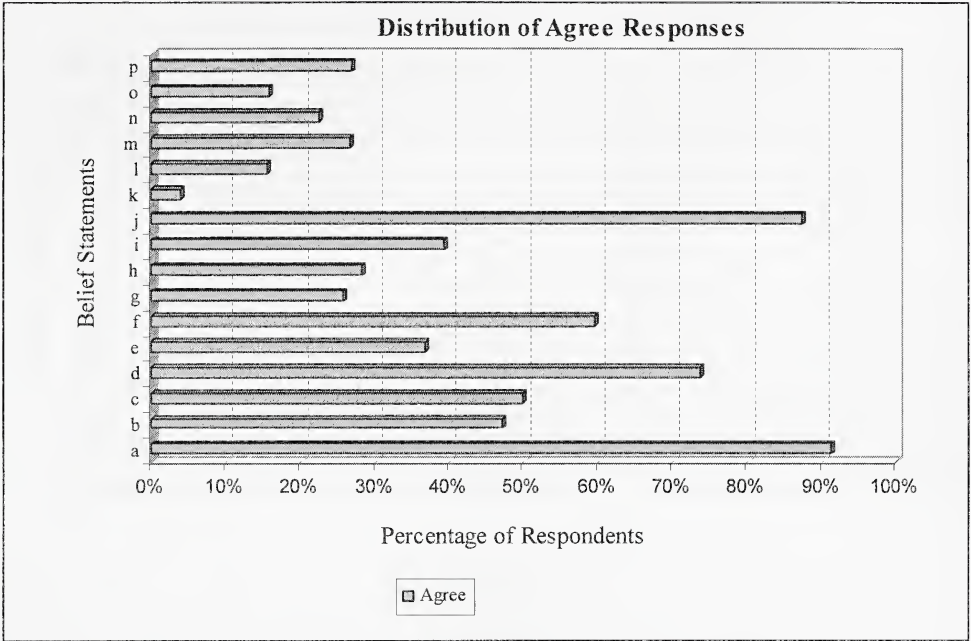
Appendix 14: Crosstabulation of Use of Co-op in the last 12 months Vs. Other Variables

		Use of co-operatives in the last 12 months						Total	
		Yes		No		Might			
Age of respondent	21-34	13	11.7%	4	12.5%	5	22.7%	22	100%
	35-44	17	15.3%	5	15.6%	5	22.7%	27	100%
	45-54	31	27.9%	13	40.6%	6	27.3%	50	100%
	Over 55	50	45.0%	10	31.3%	6	27.3%	66	100%
	Total	111	100%	32	100%	22	100%	165	100%
Gender	Female	30	27%	7	21.9%	10	46%	47	100%
	Male	80	73%	25	78.1%	12	55%	117	100%
	Total	110	100%	32	100.0%	22	100%	164	100%
Income level (\$'000))	< \$49	51	47.2%	9	28.1%	12	63.2%	72	100%
	\$50-99	37	34.3%	19	59.4%	5	26.3%	61	100%
	\$100-149	10	9.3%	4	12.5%	2	10.5%	16	100%
	\$150-199	7	6.5%	0	0.0%	0	0%	7	100%
	>\$250	3	2.8%	0	0%	0	0%	3	100%
	Total	108	100%	32	100%	19	100%	159	100%
Level of education	< High School	8	7.2%	4	13%	1	4.5%	13	100%
	High School	26	23.4%	3	9.4%	6	27.3%	35	100%
	College Tech.	33	29.7%	11	34.4%	5	22.7%	49	100%
	University	32	28.8%	10	31.3%	6	27.3%	48	100%
	Grad School	12	10.8%	4	13%	4	18.2%	20	100%
	Total	111	100%	32	100%	22	100%	165	100%
Location of Residence	Urban	75	69.4%	24	75.0%	18	81.8%	117	100%
	Rural	33	30.6%	8	25.0%	4	18.2%	45	100%
	Total	108	100%	32	100%	22	100%	162	100%
Intention to purchase from Co-operatives	More Inclined	0	0%	1	3.1%	0	0%	1	100%
	Inclined not	1	0.9%	0	0%	0	0%	1	100%
	Slightly Inclined	0	0%	0	0%	0	0%	0	0%
	Indifferent	34	30.9%	14	43.8%	10	45.5%	58	100%
	Slightly Inclined	23	20.9%	6	18.8%	3	13.6%	32	100%
	Inclined	33	30.0%	10	31.3%	5	22.7%	48	100%
	More Inclined	19	17.3%	1	3.1%	4	18.2%	24	100%
	Total	110	100%	32	100%	22	100%	164	100%
Use of co-operatives in the last 12 months	Extremely Unlikely	1	0.9%	1	3.1%	0	0%	2	100%
	Slightly Unlikely	2	1.8%	1	3.1%	0	0%	3	100%
	Unlikely	0	0%	0	0%	0	0%	0	0%
	Not Sure	2	1.8%	3	9.4%	0	0%	5	100%
	Slightly Likely	9	8.1%	6	18.8%	2	9.1%	17	100%
	Likely	49	44.1%	18	56.3%	15	68.2%	82	100%
	Extremely Likely	48	43.2%	3	9.4%	5	23%	56	100%
	Total	111	100%	32	100%	22	100%	165	100%
Membership Status	Current	93	96.9%	2	2.1%	1	1.0%	96	100%
	Never	12	27.3%	18	40.9%	14	31.8%	44	100%
	Former	6	25.0%	12	50.0%	6	25.0%	24	100%
	Total	111	100%	32	100%	21	100%	164	100%

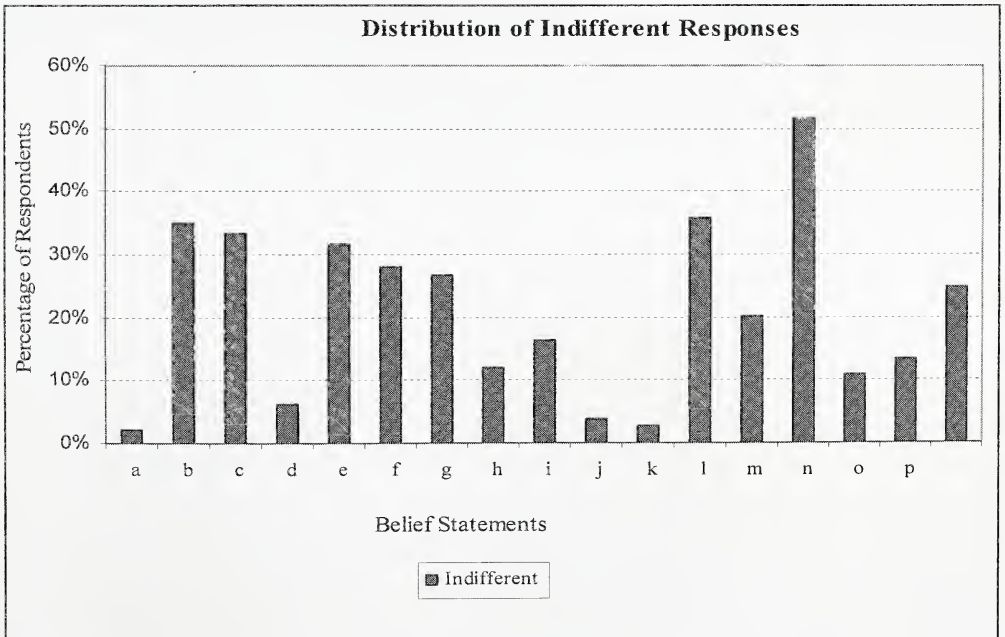
Appendix 15: Membership status in Co-operatives

		<i>Current</i>		<i>Never</i>		<i>Former</i>		<i>Total</i>	
		<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>
Age of respondent	21-34	10	9.9%	8	17.8%	4	16.7%	22	100%
	35-44	14	13.9%	13	28.9%	2	8.3%	29	100%
	45-54	29	28.7%	13	28.9%	10	41.7%	52	100%
	Over 55	48	47.5%	11	24.4%	8	33.3%	67	100%
	Total	101	100%	45	100%	24	100%	170	100%
Gender	<i>Female</i>	24	24.0%	18	40.0%	6	25.0%	48	100%
	<i>Male</i>	76	76.0%	27	60.0%	18	75.0%	121	100%
	Total	100	100%	45	100%	24	100%	169	100%
Income level (\$'000's)	< \$49	43	43.9%	23	53.5%	8	33.3%	74	100%
	\$50-99	36	36.7%	17	39.5%	11	45.8%	64	100%
	\$100-149	8	8.2%	3	7.0%	5	20.8%	16	100%
	\$150-199	7	7.1%	0	0%	0	0%	7	100%
	>\$250	4	4.1%	0	0%	0	0%	4	100%
	Total	98	100%	43	100%	24	100%	165	100%
Level of education	< <i>High School</i>	9	9.0%	3	6.7%	2	8.3%	14	100%
	<i>High School</i>	23	23.0%	8	17.8%	5	20.8%	36	100%
	<i>College Tech.</i>	30	30.0%	14	31.1%	5	20.8%	49	100%
	<i>University</i>	28	28.0%	13	28.9%	9	37.5%	50	100%
	<i>Grad School</i>	10	10.0%	7	15.6%	3	12.5%	20	100%
	Total	100	100%	45	100%	24	100%	169	100%
Residence location	<i>Urban</i>	67	68.40%	32	72.70%	21	87.50%	120	100%
	<i>Rural</i>	31	31.60%	12	27.30%	3	12.50%	46	100%
	Total	98	100%	44	100%	24	100%	166	100%
Intention to purchase from Co-operatives	<i>More Inclined</i>	0	0%	1	2.20%	0	0%	1	100%
	<i>Slightly Inclined</i>	0	0%	0	0%	0	0%	0	0%
	<i>Inclined not</i>	1	1.0%	0	0.0%	0	0.0%	1	100%
	<i>Indifferent</i>	26	26.0%	18	40.0%	14	58.3%	58	100%
	<i>Slightly Inclined</i>	23	23.0%	9	20.0%	2	8.3%	34	100%
	<i>Inclined</i>	32	32.0%	14	31.1%	4	16.7%	50	100%
	<i>More Inclined</i>	18	18.0%	3	6.7%	4	16.7%	25	100%
	Total	100	100%	45	100%	24	100%	169	100%
Consideration to patronize Co-operatives	<i>Extremely Unlikely</i>	1	1.0%	1	2.2%	0	0.0%	2	100%
	<i>Slightly Unlikely</i>	0	0%	2	4.4%	1	4.2%	3	100%
	<i>Unlikely</i>	0	0%	0	0%	0	0%	0	0%
	<i>Not Sure</i>	2	2.0%	2	4.4%	1	4.2%	5	100%
	<i>Slight Likely</i>	8	7.9%	6	13.3%	4	16.7%	18	100%
	<i>Likely</i>	45	44.6%	24	53.3%	13	54.2%	82	100%
	<i>Extremely Likely</i>	45	44.6%	10	22.2%	5	20.8%	60	100%
	Total	101	100%	45	100%	24	100%	170	100%
Use of co-operatives in the last 12 months	<i>Yes</i>	93	96.9%	12	27.3%	6	25.0%	111	100%
	<i>No</i>	2	2.1%	18	40.9%	12	50.0%	32	100%
	<i>Might</i>	1	1.0%	14	31.8%	6	25.0%	21	100%
	Total	96	100%	44	100%	24	100%	164	100%

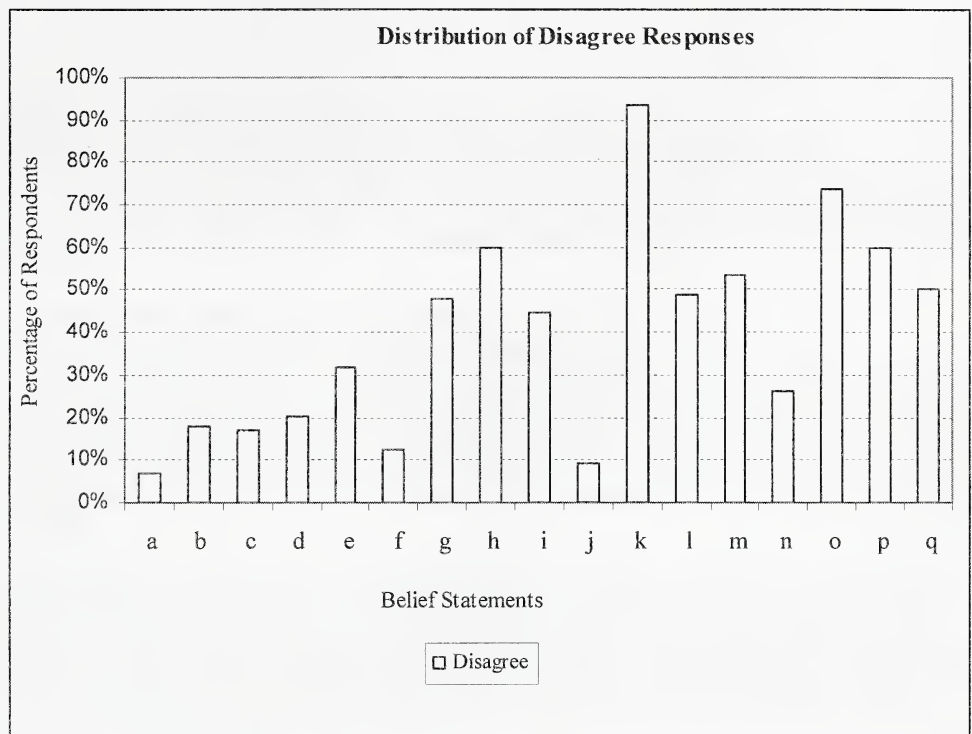
Appendix 16: Percentage of Respondents in Agreement with Belief Statement



Appendix 17: Percentage of Respondents Indifferent to Belief Statement



Appendix 18: Percentage of Respondents in Disagreement with Belief Statement



End notes

ⁱ Finlayson, D., Edmonton: The Edmonton Journal, , June 23, 2005

Lilydale no longer a co-op after 65 years: Corporate format helps in raising capital.

Lilydale Foods, one of Canada's largest poultry processors, has voted to end its 65-year life as a co-operative and convert to a conventional corporate structure. Lilydale suffered its largest ever loss in fiscal 2003 -- \$16.3 million -- as it groaned under the weight of \$65 million in long-term debt. and,

Canada NewsWire, 2005, <http://www.newswire.ca>

Lilydale Creates New Structure to Capture Opportunities, June 23, 2005 ed

Delegates attending Lilydale Co-operative Limited's annual and special meeting in Edmonton voted in favor of a resolution to convert the poultry processor from a cooperative to a corporation. Their decision followed months of consultation with the 1,336 Canadian farmers who own Lilydale. The Alberta Court of Queen's Bench granted a final order in respect of the arrangement on Wednesday, June 22, 2005. It is anticipated that the conversion will become effective on June 26, 2005.

ⁱⁱ There is only one valid definition of business purpose: to create a customer. It is the customer who determines what a business is. For it is the customer, and he alone, who through being willing to pay for a good or service, converts economic resources into wealth, things into goods. What the business thinks it produces is not of first importance – especially not to the future of the business and its success. What the customer thinks he is buying, what he considers “value” is decisive . . . (Drucker, 1954, p. 37).

When you pass through the waters I will be with you; and through the rivers, they shall not overwhelm you; when you walk through fire you shall not be burned, and the flame shall not consume you. Isaiah, 43²

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